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AN ANALYSIS OF THE METRICS USED IN THE UNITED STATES NAVY'S ENLISTED SUPPLY CHAIN AS THEY APPLY TO THE ROYAL AUSTRALIAN NAVY

by

Peter E. H. Chapman

December 2012

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This research was conducted at the request of the Royal Australian Navy's Directorate of Navy Capability Structures and Guidance, in order to determine approaches to more efficiently and effectively manage its workforce. Resource constraints are causing dramatic changes to management priorities within the Australian Defence Force, creating a need to explore innovative approaches to improving business practices. This thesis presents an in-depth review of supply chain management and human capital measurement techniques used by the United States Navy's Enlisted Supply Chain and the private sector. Recommendations made in this thesis aim to provide the Royal Australian Navy with innovative techniques to adopt in order to meet their human capital needs in a highly competitive market for labor. This is suggested in order to reduce resource pressure, while meeting the mission requirements of the Australian Defence Force White Paper.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADF   Australian Defence Force

ALNAV   Accessions Losses Navy

APS   Australian Public Service

COB   Current on Board

CN   Chief of Navy

DEP   Delayed Entry Program

DMO   Defence Material Organisation

ECM   Enlisted Community Manager

EPA   Enlisted Program Authorization

FY   Financial Year

HMAS   Her Majesty Australia Ship

HR   Human Resources

HRM   Human Resource Management

IT   Information Technology

NGN   New Generation Navy

NRC   Naval Recruiting Centre

PLM   Production Line Manager

PMO   Production Management Office

RAN   Royal Australian Navy

ROI   Return on Investment

SPR   Strategic Reform Program

USN   United States Navy

WAR   Weekly Accessions Report

WIP   Work in Process

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I.   INTRODUCTION

In developed economies, the private sector understood the need to manage human capital in a strategic and systematic way as early as the 1960s. In the late 1990s the private sector started to use non-traditional techniques to manage human capital. This was accomplished through the use of techniques developed by disciplines such as supply chain management and Six Sigma to improve effectiveness and efficiency. The organizations that adopted such techniques prior to 2008 were market leaders in their industries, and were the same organizations that have on average fared much better than their competitors during the global financial crisis.

Since 2007, the United States Navy (USN) is one of the few public sector or government organizations that has taken the lead set by the private sector and adopted systematic planning to improve management of its 333,000 strong workforce in order to achieve cost savings and efficiency gains. The USN proactively manages its human capital using a supply chain model to meet the capability requirements set by the United States Government.

The research in this thesis highlights how large public sector and government organizations can strategically manage their workforces. The thesis provides an in depth review of how the USN's supply chain approach is used to effectively and efficiently manage its workforce, and it makes recommendations of techniques that can be adopted by the Royal Australian Navy (RAN) to efficiently meet its workforce mission requirements.

The RAN is the major stakeholder to benefit from this research; however, the research presented in this thesis adds to the academic literature on human capital management by providing an in-depth review of supply chain management techniques used to manage workforces in the private and public sectors. Therefore, this research can also benefit public sector organizations, as well as organizations that operate primarily with an internal labor supply model. The key stakeholders within the RAN are the units

responsible for recruiting, initial training, category training and career management; as well as the Fleet Commander, who is the end customer.

A.   SCOPE

The management system designed by the USN took direct input from key stakeholders and many years of development to implement a functional system. Time and resource restrictions limit this research, and as a result it cannot serve as a readymade guide for how the RAN can immediately implement a human capital supply chain management system. Many areas, including command and control structures and supporting information systems technology, will require discussion and agreement at the senior strategic level of the RAN.

This research is wide in scope spanning across all areas of performance measurement and metrics used in the private sector while focusing on areas of human capital and workforce management. Along with the research conducted on the USN's model, the academic literature reviewed for this research will form a template for how public sector and government organizations can apply these techniques to their human capital management.

B.   OBJECTIVES

The objective of this research is to review existing human capital measurement approaches, and to make recommendations that the RAN can implement. This outcome is achieved by providing the following deliverables:

- Formulate a general set of steps for implementing a human capital measurement system, accompanying metrics and an executive dashboard
- Examine whether the USN supply chain management model is a valid construct for the RAN to use to manage its human capital
- Outline implementation considerations for a human capital measurement system for the RAN

C.   METHODOLOGY

The information for this research has been gathered from a comprehensive review of the following sources:

- Academic and professional literature
- Thorough survey and consultation with the USN's Production Management Office (PMO) in Millington, Tennessee
- A professional workshop conducted by the Saratoga Institute on the use of human resource management (HRM) metrics and HRM dashboards

This research does not use any data collection, surveys or statistics. Any data presented in the research and its figures are "mock" data used for illustration purposes only.

D.   BACKGROUND: ROYAL AUSTRALIAN NAVY

The remainder of this chapter provides the necessary background on the RAN to be able to apply the concepts from the material in Chapter II to the case study in Chapter III. The reason for providing this background is twofold. First, the catalyst for the topic of this research is based on the explicitly stated strategic direction of the Australian Defence Force (ADF) and RAN. Second, when making recommendations in Chapter IV this research does not make assumptions about strategy and environmental conditions, but will instead take the explicit facts from ADF and RAN published documents.

1.   ADF White Paper

The ADF White Paper (2009) explains how the Australian Government has planned future military and defence requirements. The White Paper focuses on how to achieve the goals to sustain a force through the year 2030 and specifically lays out the Government's future plans for the development of "Force 2030," including the major investments and acquisitions required to execute the desired capability objectives.

The White Paper brings attention to the internal challenges the ADF faces to overcome organizational and resource challenges to achieve long term reform and remediation. From a human capital point of view the key internal challenges are increasing recruitment and retention with a reduced budget allocation. The ADF wants to ensure its people and systems are up to the challenges likely to be faced over coming years. As well as the ability to plan out equipment capability, the ADF will require long-term and deliberate strategies to recruit and retain the skilled people needed from the

labor market. While the White Paper highlights these resource issues, the Strategic Reform Program (SRP) will be the initiative that will achieve the results.

Over time, assumptions will change and there will be a requirement to amend the White Paper accordingly. The Australian Government originally intended reviewing and updating the White Paper every five years to ensure its currency. However, in May 2012, the Government announced the White Paper will be reviewed in 2013, a full year earlier than planned (Blenkin, 2012). The Government also plans to do a formal strategic risk assessment, comprehensive force structure review and an independent audit review the year prior to the review of the White Paper.

a.   *The White Paper and Workforce Planning*

Investment in recruitment, training, education and the career development of the ADF's personnel will continue to pay substantial dividends. Investment in personnel will increase the country's ability to achieve campaign objectives and reduce casualties. The Australian Government expects the ADF to become more businesslike, efficient and prudent in its use of resources, with the aim of being resource efficient and achieving better economies of scale (Department of Defence, 2009a; 2009b). As part of this directive, the Government has directed the ADF to develop a strategic approach to workforce management at all levels of the ADF organization. As stated in the 2009 White Paper:

> The Government has directed Defence to develop a strategic approach to people. This will be delivered by improving workforce strategy and alignment through the defence people management framework, improving governance arrangements, and an integrated workforce intelligence model. The planning document, the *Defence People Strategy*, will be the foundation on which the future workforce will be built over time. It will be based on a range of initiatives to improve Defence's management of its people, including recruitment, retention, job satisfaction and workplace reform. Over the next four years, the Government will invest in targeted improvements in the areas of remuneration, supporting Defence families, housing and accommodation, health and rehabilitation and diversity. (Department of Defence, 2009a, p.115)

The Australian Government has directed that the end result of this strategic effort will be a leaner business support model, a largely civilianized and professionalized non-deployable military workforce, and the conversion of contractor positions to less expensive full-time civilian positions (Department of Defence, 2009a; 2009b). This will be achieved by streamlining and automating workflows, and centralizing shared services and functions. The implementation of timely and accurate information systems will be critical to the success of these objectives.

As part of the White Paper the Australian Government recognizes that the way the ADF workforce numbers were previously determined are outdated. Moving forward since the White Paper was published, the ADF has been directed to look at the cost of the total workforce mix rather than the composition of each component of the workforce. The key cost saving in this workforce mix is reducing the number of contractors and transferring administrative military position to civilian positions.

2. Strategic Reform Program

The "Strategic Reform Program" (SRP) is an ADF-wide initiative with the purpose of creating an efficient and accountable organization. By achieving the objectives set in the SRP the ADF will be able to deliver and sustain Force 2030, within the funding allocation agreed to by the Australian Government.

The requirement for the reform is necessary if the ADF wants to achieve the requirements of Force 2030 during a period where government does not have the budgetary flexibility to allocate additional resources to the ADF if it is inefficient. The SRP has already fundamentally changed the methods in which the ADF utilizes its resources to make it a more efficient and effective organization. The end result will be significant savings that can be reinvested back into the ADF to build towards a stronger Force 2030.

The fixed target for the ADF is to achieve a gross savings of $20 billion over the first ten years of the SRP, through 2019. Of the $20 billion in savings, $3.3 billion is to be saved from workforce and workforce infrastructure shared services (Department of Defence, 2009b). These savings will be reinvested to deliver stronger capabilities, to

remediate areas previously lacking funding and to modernize administrative and support functions of the ADF "enterprise backbone."

The SPR was developed based on the findings and recommendations of eight ADF internal "Companion Reviews" that examined the ADF's internal operations, as well as a review of its Intelligence Capability and a review of Capability Procurement and Sustainment. The result of these ten separate reviews across different functions of the ADF is a comprehensive analysis of the "backbone" of the ADF's business functions and resource allocations, while considering the impact of emerging commercial, technology and business trends. The summary of the combined findings of these reviews showed a need for the ADF to make improvements in the following areas:

- Provide a better understanding of the underlying drivers of the costs of ADF and promote discipline in ADF spending

- Fundamentally improve procurement practices to build a stronger business-like culture and to deliver projects on time and on budget

- Provide a more informed basis on which government can choose where and when to spend money in order to provide the most effective capability to defend Australia

- Ensure that information technology effectively supports and informs decision makers at all levels, and across all domains

- Develop a better understanding of the cost drivers associated with different levels of preparedness for all ADF capabilities to conduct and sustain operations, to allow making better informed decisions on the financial impact of changes in those levels

- Implement techniques to eliminate duplication and waste in maintaining capabilities, increase their operational availability and reduce the cost of ownership

- Modernize the ADF warehousing and distribution infrastructure

- Create an efficient "back office" through the extension of shared service delivery models

- Determine the appropriate mix and size of Australia's workforce that balances capability risk and workforce cost, and seeks to build expert capabilities

This list spans the whole ADF organization in order to achieve the goal of cost savings and efficiency. To help focus these goals, the SRP outlines three principles to achieve the desired results as follows:

- Improved accountability in the ADF
- Improved ADF planning
- Enhanced productivity in ADF

b. *Improved Accountability*

One of the three keys means to achieving the goals of the SRP is to improve accountability. The SRP handbook further elaborates by listing the following five principles with which this will be achieved (Department of Defence, 2009b):

- Clarify and sharpen internal accountabilities.
- Introduce an authoritative and transparent
- Better measured and managed organization performance.
- Improve committee and decision-making systems.
- Improve the quality of advice to Government and Ministers.
- Further strengthen the internal audit function.

c. *Enhanced Productivity*

A key principle of the SRP is improving the efficiency of the resources the ADF is allocated from the Government. The Government's goal is for the ADF to become more "business-like" in its "back-office" functions, more efficient, and more prudent in its use of resources. Wherever possible Navy, Army and Air Force should work together to centralize and standardize shared services and functions to achieve economies of scale.

In part, the majority of the $3.3 billion in workforce and personnel savings under the SRP will be achieved through civilianizing military support positions and converting contractor positions to Australian Public Servants (APS). By civilianizing some military support positions, permanent military personnel will be employed where they are critical to delivering and sustaining combat capability. Savings will be achieved through the cost of APS employees being approximately thirty per cent less than those of the ADF.

3. New Generation Navy

New Generation Navy (NGN) is the RAN's philosophy for culture change and development of its future leaders. The program was established in April 2009 under a Chief of Navy (CN) Directive in order to address the cultural, leadership and structural changes required for the Navy to meet the challenges of delivering future capability. NGN was established with a five-year time frame in which to achieve its objectives. An outline of the current situation, objectives and end goals for NGN's direction is shown in Figure 1.
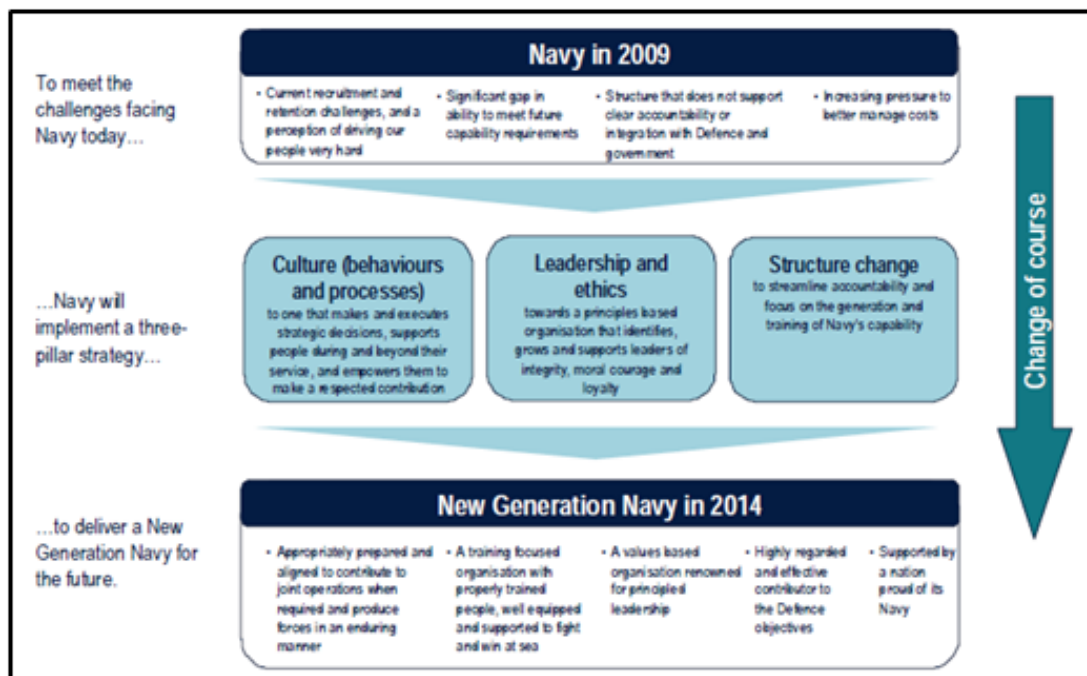
Figure 1.   Overview of the NGN Strategic Plan (From Department of Defence, 2009c)

The vision for NGN is that it represents the energy and commitment the RAN's people have provided to the future of the Navy in response to a drive towards cultural and leadership improvement. The improvement that is being asked of each member of the RAN is aware of, and performing in accordance with the NGN Signature Behaviours, shown in Figure 2. The NGN Signature Behaviors were established to serve as a framework for behavior, leadership and decision making. The NGN Signature Behaviors

were developed from the already existing RAN Values of Honour, Honesty, Courage, Integrity and Loyalty.

People	Respect the contribution of every individual	• Recognise the value of each person's contribution to Navy • Be respectful of role, experience and background • Value diversity
	Promote the wellbeing and development of all Navy people	• Develop Navy people to their full potential • Know and care for people • Keep people at the core of all decisions • Build the team – provide guidance and challenge their abilities
	Communicate well and regularly	• Keep your team informed • Be clear, consistent, timely and accurate • Engage thoughtfully and check for understanding • Express and receive feedback graciously
Performance	Challenge and innovate	• Challenge, question and be open to change • Generate new ideas • Support creative solutions
	Be cost conscious	• Understand the cost implications of the decisions you make • Find solutions that are enduring, efficient and add value • Use it like you own it
	Fix problems, take action	• Seek and accept responsibility • Take ownership of what you say you will do • Turn your ideas into actions • Be a part of an effective solution
	Drive decision making down	• Make sound, timely decisions based on principles not just rules • Drive decisions to the appropriate level • Trust and support people to make good decisions
Professionalism	Strengthen relationships across and beyond Navy	• Work together to identify and achieve common purposes and objectives • Build inclusive partnerships • Deliver on Navy's promises, and do it well
	Be the best I can	• Strive for professional excellence • Know yourself and seek self-improvement • Maintain your personal wellbeing
	Make Navy proud, make Australia proud	• Lead by example • Value Navy's identity and reputation • Live Navy's values

Figure 2.   RAN New Generation Navy Signature Behaviours (From Department of Defence, 2009c)

A key focus of NGN is changing the way leaders are trained, with a focus on what makes an effective, inclusive and ethical leader. With an improved leadership culture and compliance with NGN at the senior level, NGN has the best possible chance of achieving its goal of cultural reform and improving the organization's working environment.

The significance of NGN on workforce planning and human capital management is that it should significantly improve retention of personnel, efficiency of career path progression and "word-of-mouth" recruiting from its workforce. With the reduction in "kinship" recruitment as the number of veterans diminishes, the need for internal ambassadors to help drive recruitment is critical to ensure the RAN meets its human capital capability requirements. Such ambassadorship cannot be forced or disingenuous, making the NGN's sincere objective of cultural change the best initiative to help the

RAN achieve improved recruitment and retention using more organic methods through the NGN initiative.

4.   People in Defence Strategy

In November 2009, in response to the requirements set out in the White Paper and the need for reform outlined in the SRP, the ADF released the "People in Defence" strategy. As stated by the initial report the purpose of the strategy is;

> … to begin the conversation to ensure we attract and retain the people needed to deliver Force 2030. This document outlines our approach to identifying what success will look like for our people and working out ways to achieve that success. "People in Defence" is not about telling our people what the answer is; rather it's about working together to generate the vision and Blueprint that describes what we will do together to build Force 2030. (Department of Defence, 2009d, p.1)

The purpose of the strategy is to have the personnel capability to carry out Force 2030, not in 2030, but by the year 2015. Rather than planning further ahead, the strategy is looking at the force indicators required by 2015 to show that the ADF is on track for Force 2030.

The document outlines three different perspectives of the vision for the force in 2015. The three different perspectives are from the point of view of the wider Australian community, the ADF people (current and future), and the Australian Government. The most notable of these three, when considering human capital and workforce planning, is the perspective of the current and future employees of the ADF. The force success factors to be achieved by 2015 and how they can be measured are outlined in Figure 3.

The RAN can use the information and vision from the People in Defence strategy to make suggestions regarding the future personnel requirements within the ADF. It will important for the RAN to align itself with the other ADF groups to ensure the whole force is reaching the 2015 force targets and, therefore, tracking towards 2030. Any RAN-specific workforce, personnel or human capital initiative needs the factors shown in Figure 3.
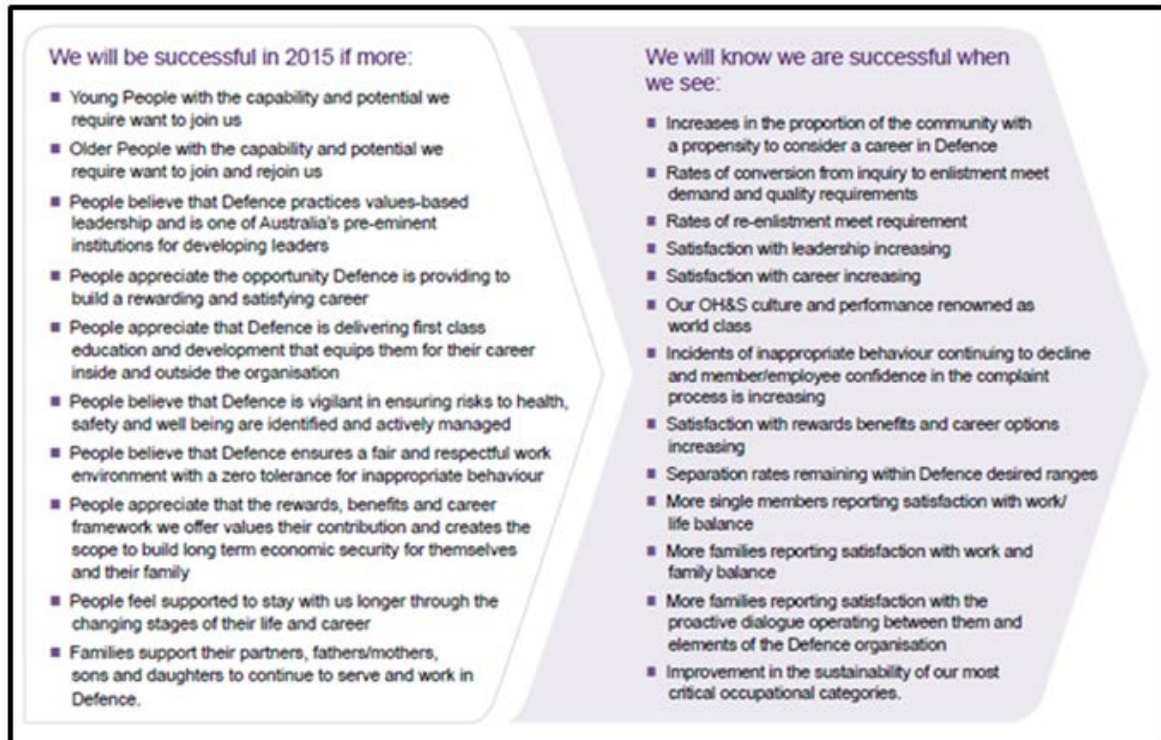
Figure 3. Force 2015 Success Factors (From Department of Defence, 2009d)

5. Project Lazer

Project Lazer was developed by the ADF to collect information from uniformed personnel about their satisfaction, attitudes and expectations regarding their role within the military. The first year's data was collected was 2008. The need for such an initiative was based on concern regarding the ability of the ADF to attract and retain the required number and standard of personnel to meet force requirements. The project is a longitudinal study aimed at assessing change in response over time, with the ultimate goal of more accurately understanding the factors that decide if a member of the ADF chooses to leave or stay at different career milestones. The timeline of the career milestones at which a member receives each survey under Project Lazer is illustrated in Figure 4.
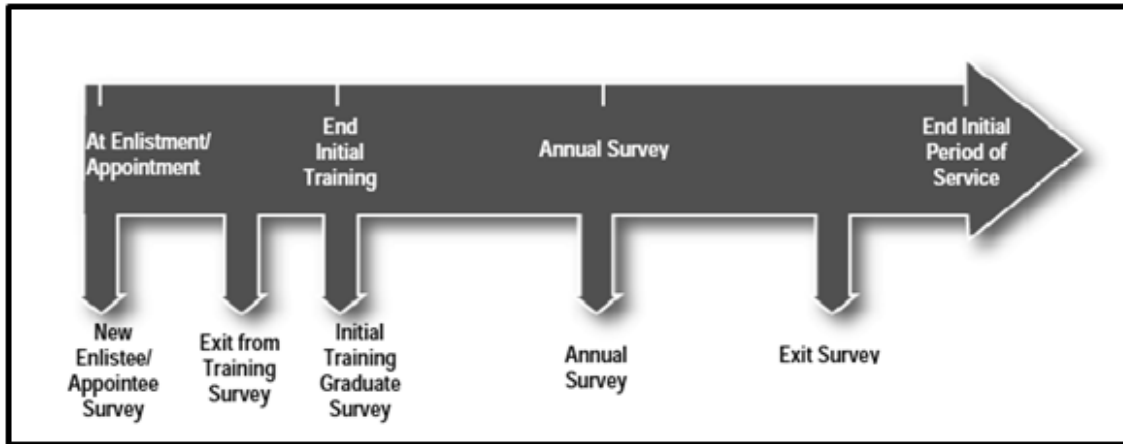
Figure 4.   RAN Enlisted Career Milestone Timeline (From Barton & Johnson, 2007)

Although the ADF previously had many of these surveys, the significance is that they are now linked to provide understanding of the changing attitudes of individuals and links cohorts across time. The information gained from Project Lazer will be extremely valuable to the ADF in understanding common themes and trends across the force that can be enhanced or remediated, depending on if they are perceived as strengths or weaknesses to the recruitment and retention of ADF uniformed personnel.

During the development of the project the "ADF Model of Military Turnover" was developed to understand the decision points and factors associated with staying or leaving the military, shown in Figure 5 (Barton & Johnson, 2007). The way this model is set up in a linear thought process is extremely interesting because of its similarities to supply chain and inventory management. Using the information from the Project Lazer output, the ADF should be looking to remedy the decision factors that lead to turnover and enhance those that do not. By doing this, the ADF can systematically reduce the first-term attrition rate by tracking the survey data and understanding which initiatives improves behavior.
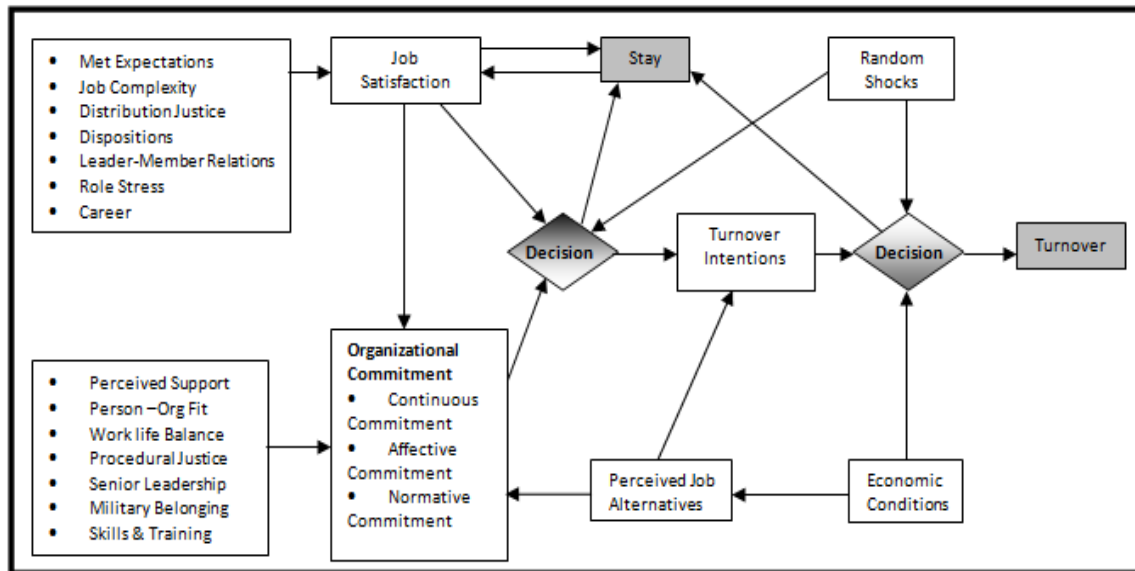
Figure 5.   ADF Model of Military Turnover (From Barton and Johnson, 2007, p.3)

6.   Rizzo Review

Due to the forced decommissioning of HMAS MANOORA and HMAS KANIMBLA, and continuing maintenance problems experienced with HMAS TOBRUK, the Australian Government was forced to ask questions related to why the RAN and the Defence Material Organisation (DMO) were mismanaging the Navy's fleet assets (Rizzo et al., 2011). The Government acted by commissioning the "Rizzo Review" to examine and explain the cause, impacts and solutions to the maintenance problems paralyzing the Navy's capability.

Rizzo submitted his final report to the Australian Government in July 2011. He concluded that there was a clear existence of a culture within the RAN and DMO that accepted inadequate maintenance and sustainment practices despite the knowledge of the existence at all levels of the two organizations. Rizzo attributed this deep cultural problem to poor "whole-of-life" asset management, organizational complexity and blurred accountabilities, inadequate risk management, poor compliance and assurance, a "'hollowed-out" RAN engineering function, resource shortages in the System Program Office in DMO, and a culture that placed the short-term operational mission above the need for technical integrity.

The report stated that the first key step to a remedy and avoiding poor management of future platforms was for the RAN and DMO to improve coordination and integrate their interdependent activities more effectively. The report outlined twenty-four recommendations with the primary theme coordination and integration between the RAN and DMO. The report outlined the problem of the "can do, make do" culture within the two organizations and how this must be removed and replaced with a strong emphasis of sustained vessel integrity. The final theme within the recommendations was related to the future improvements to be made in the workforce, leadership and training of the RAN engineering function. Table 1 shows six recommendations from the report related to the remedies for improving the way the RAN can improve ship sustainability specific to workforce planning, leadership and training.

Rebuild Navy Engineering Capability	Navy engineering should be rebuilt and reorganized to reduce fragmentation, increase authority, clarify accountability and enable the Head Navy Engineering to fulfill his role as the Technical Regulatory Authority. It should be led by a two-star Navy officer to give weight to this Important technical and compliance function.
Reinstate the Cultural Importance of Technical Integrity	Navy, in collaboration with DMO, should introduce a cultural change program that promotes technical integrity as a key enabler of operations.
Confirm Maritime Resourcing	Given the evident strains of today, the ADF and DMO should confirm to Government that they will have sufficient resources and skills to operate and maintain materiel that is committed for naval service over the next ten years.
Increase Resources for Capability Management	Navy should enhance capability management by: • Creating a dedicated cell to analyze, evaluate, and continually assess the state of the Fleet against the Materiel Sustainment Agreement • Increasing the resources assigned to Capability Management • Changing the Workforce Posting Priority to "Three" for Navy staff appointed to sustainment, in line with that of acquisition
Establish Effective Navy Workforce Planning	Navy should establish an effective workforce planning system to ensure staff have the skills and experience required for complex sustainment roles.
Foster Engineering Talent	DMO and Navy should develop an innovative and comprehensive through-life career plan for the recruitment, retention and development of their engineering talent.

Table 1.   Rizzo Review Recommendations (From Rizzo et al., 2011)

7.   Personnel in Defence Scan 2025

In 2006, Riech et al. produced the "Personnel in Defence Scan 2025" to provide a context for the personnel environment and related weaknesses and strengths that are

likely to impact the way the ADF conducts workforce planning in the future. The report is a rolling strategic view of the personnel environment that is routinely updated. The significance of this report to the research in this thesis is the author will not make personnel assumptions regarding the personnel environment of the ADF and/or RAN in the Chapter III practical example, but instead will take the research from Scan 2025 that Riech et al presented to the ADF.

The aim of Scan 2025 was to update and build upon Scan 2020 to project the personnel trends, challenges, strengths and weakness to the year 2025. The purpose of the report was to provide an in-depth personnel analysis as a framework for ADF personnel strategic analysis, planning, policies and projects. The report outlines this framework by providing the following detailed information about the personnel environment:

- Analyze relevant contemporary national and international personnel related reports, expert and practitioner opinion and judgments that are available in the public arena from other government organizations, academia, industry and professions, trade and union organizations.

- Identifies and describes future war-fighting, social, economic, demographic, educational, health, climate change, energy and water resources, and technological trends that will impact on the Department of Defence's ability to manage its total workforce to the year 2025.

- Provides the ADF with forward-thinking HRM intelligence for a best position in terms of workforce outcomes necessary to sustain war fighting capabilities and to ensure a total work force profile that can support its military requirements.

- Provides the ADF with an idea of the likely level of national support infrastructure and related workforce skills available to sustain and maintain ADF logistic support capabilities.

The following quote is from the conclusion of the Scan 2025 report, and highlights the important changes Riech et al. feel will likely to impact the ADF's personnel environment according to:

> Defence will be required to make significant personnel policy changes in how it recruits, develops, sustains, retains and transitions its people to account for the emerging demographic, societal, workplace/workforce, economic, climate, health, educational, globalization and technological trends. To sustain tomorrow's national workforce, economic performance and the social culture, strategies which consider individual lifestyles,

community and social responsibilities need to be developed. (Riech et al., 2006, p.xxxi)

Based on changes predicted by Riech et al. in the Scan 2025 report, they outline the following seven points as the most critical personnel issues that could inhibit the ADF having the human capital capability to sustain the force in 2025:

- There is a global economic struggle between nations, organizations and communities to achieve high-talent workforces.

- Australia's rapidly aging population and declining labor force participation rates will adversely impact on ADF's ability to meet and maintain its workforce goals.

- Many ADF critical trades and professions are unlikely to recover to full strength in the short or medium term due mainly to high global and local skill demand.

- The quantity and quality of available candidates is likely to decrease.

- The development of organizational commitment via the building of trust, provision of a compelling employment offer and having a learning culture suited to the emerging environment, is critical to achieving overall organizational workforce success.

- Techniques, processes and technologies will be essential in facilitating workforce knowledge transfer, skill development and the delivery of a learning culture.

- Workforce sustainment will become significantly more important.

E. CHAPTER SUMMARY

Due to economic conditions and a mandate from the Australian Government, the RAN has been forced to change the way it allocates, uses, manages and measures resources. The major catalyst for change within the ADF came when the Australian Government described where the ADF must be by 2030 via the White Paper. The Strategic Reform Program highlighted previous mismanagement of ADF resources across the whole organization. While the Rizzo Review and New Generation Navy identified RAN specific deficiencies in training, culture and resource allocation that has led to a deterioration of force capability required by government.

The challenges faced by the ADF, as highlighted in this chapter, are addressed in the rest of this thesis through an in-depth review of supply chain management techniques,

and by making recommendations that can be adopted by the RAN to improve efficiency and effectiveness of its human capital.

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II. LITERATURE REVIEW

The scope of this chapter is intended to be broad within the subject areas of strategic management and human resource management. The purpose of this is to highlight the appropriate academic literature and practical applications within these subject areas to draw upon them further in the case study in Chapter III.

This chapter is broken into two sections in order to present a comprehensive review of the prior research and current best practice in the stated subject areas. First, the chapter presents an examination of the academic literature in human capital management, human capital metrics, strategic management dashboards and the use of operations management techniques in human capital management. Second, the chapter reviews the current practices used by the United States Navy (USN) because of its innovative approach to human capital management and its applicability to the Royal Australian Navy (RAN).

A. REVIEW OF ACADEMIC LITERATURE

1. The Fight for Human Capital

An aging population, shifting demographics, and higher demand for skilled labor have resulted in the supply of quality employees being below the demand (*The Economist*, 2006). The rapid change in technology is further multiplying the shortage of skilled labor. Even with the increase in the unemployment rate across majority of the western economies since late 2008, there is still a shortage of highly skilled workers to give organizations the required human capital to achieve their strategies (Bidya, 2009). But, what exactly is "human capital"?

The term "human capital" is defined by LeBlanc, Mulvey and Rich (2000) as describing people and their collective skills, abilities, experience and potential. Due to the intrinsic nature of this definition, human capital is difficult to quantify and difficult to measure. Given this difficulty, a universal measure of human capital does not exist. The accounting profession is trying to regulate a single measure for human capital; however,

salary related items remain as an expense and do not appear on a balance sheet (Bullen and Eyler, 2010).

The complexity of measuring human capital is that it has many dimensions, and it is difficult to decide which aspects should be measured. Peter's and O'Connor's (1980) believe investment is created by adding motivation, knowledge, and opportunity for employees to grow the organization's human capital base, illustrated in Figure 6 (LeBlanc, Mulvey and Rich, 2000). This growth is achieved when the organization has the human capital in its system. But, how does an organization initially acquire, and provide mobility for its employees?
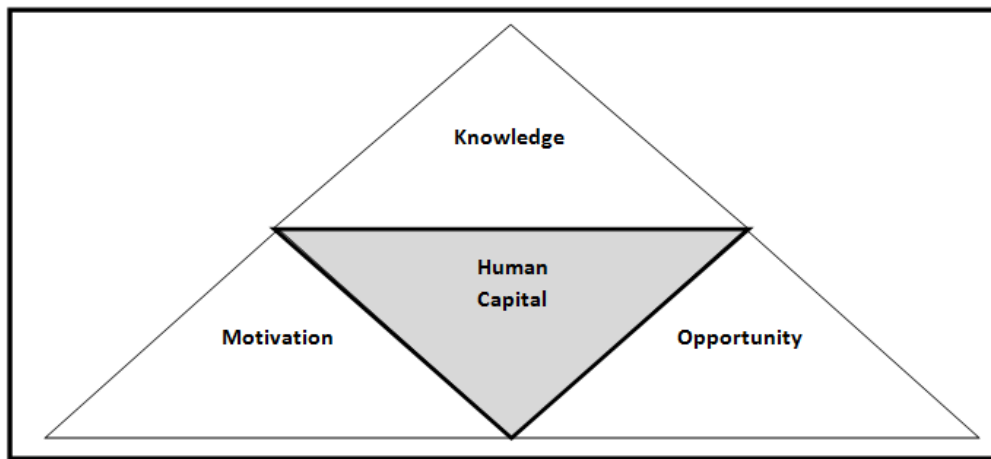
Figure 6.   Human Capital Investment (From Peters and O'Connor, 1980)

a.   Sourcing Human Capital

At the entry level, organizations recruit employees from the open labor market. When recruiting for positions above the entry level, organizations must decide to recruit those positions from internal supply, external supply, or a mix of both (Lepak & Snell, 1999). The decision of which sourcing method the organization will use plays a very key role in determining the workforce planning strategy of an organization and how it measures the effectiveness of its human capital management (Giehll & Moss, 2009). The sourcing strategy that an organization uses is most often determined by its industry and target labor market.

b. *External Human Capital Sourcing*

External recruitment from the open labor market will most likely require organizations to pay a premium to source the already skilled employees (Rouseau, 1995). Most private sector organizations use either external sourcing, or primarily external sourcing with a small mix of some internal pathways (Youndt & Snell, 2004).

External human capital sourcing allows organizations the flexibility to change the mix of human capital depending on their changing objectives (Lepak & Snell, 1999). External sourcing does not incur the costs and administrative overheads associated with the rigid internal planning process, especially since it is often redundant in an employment market where employees will inevitability come and go as they please (Lepak & Snell, 1999).

c. *Internal Human Capital Sourcing*

Internalizing human capital builds the workforces' skill base through a strong emphasis on training and development initiatives (Youndt & Snell, 2004). Government and public sector organizations are much more compatible with having an internal sourcing strategy (Lepak & Snell, 1999). The military is the extreme example of this with the rigid recruiting, training and promotion entirely based on employees being recruited solely at the entry level of the enlisted ranks

Lepak & Snell (1999) summarized that internalization increases stability and gives the organization ability to plan with firm assumptions about its human capital (Pfeffer and Baron, 1988), allows better coordination and control (Jones and Hill, 1988; Williamson, 1981), enhances socialization (Edwards, 1979), and lowers transaction costs (Mahoney, 1992; Williamson, 1975). It does, however, cost significant amounts of resources to administer the process, and it also constrains the organization's ability to adapt to environmental changes, strategic changes, or failed assumptions about the workforce (Jones and Wright, 1992; Rouseau 1995). Measurement emphasis should therefore be heavily focused on recruitment selection, training, development and turnover (Giehll & Moss, 2009).

d.   *The Value of Human Capital*

Human capital is a key strategic resource that is a necessary input to achieve the strategic objectives of almost every organization. Consider an organization losing its entire inventory of physical equipment and machinery. The organization could most likely source identical replacements within a short period of time, from a day to a few months (McLean, 1995). Now consider an organization losing its entire inventory of human capital. Losing employees severely handicaps an organization because of the investment placed in them and the knowledge they have that enables an organization to achieve its objectives (McLean, 1995). It is for this reason that it is so vital to use data and measurement techniques to provide decision makers with as much information as possible about its workforce to ensure it is managed effectively and efficiently (Davidson & Newman, 2006). Data measurement of labor trends and an awareness of economic conditions also provides information that can impact the organization's strategic human capital planning assumptions.

2.   Human Capital Metrics

The reason for using metrics in human capital management for public sector and government organizations is encapsulated in this quote from James Harrington (1991) referenced by Fitz-enz (1995):

> Measurements are key. If you cannot measure it, you cannot control it. If you cannot control it, you cannot manage it. If you cannot manage it, you cannot improve it. (Harrington, 1991, p.82)

Jac Fitz-enz has produced many influential pieces of work in the human resource management (HRM) field, but arguably none more important than his 1984 book *How to Measure Human Resources Management* Fitz-enz provides clear approaches of how to measure the value of the human resource management system. Although some parts of his work that involve profit and revenue cannot be directly applied to the public sector, it has been his approach to HRM metrics that has influenced work in human capital measurement in the literature for both the private and public sectors.

Early HRM metrics started with showing the actual output of the HRM function. Metrics were employed for number of hires, interviews conducted, disciplinary actions and other such compliance measures. Fitz-enz illustrated that metrics must be measuring "areas that matter" and not just figures that are easy to measure, with the focus on the link between human capital and organizational strategy (Fitz-enz, 1995).

The Accounting for People Task Force (2003) show that not all metrics are equally valuable to decision making through the development of a metrics hierarchy, shown in Figure 7. Workforce metrics give the least value because they often explain information that can be seen physically, such as head count or absentee numbers. What decision makers need is information that describes what is occurring with its human capital and which impacts the strategy of the organization and the efficient use of its resources (Robinson, 2009).
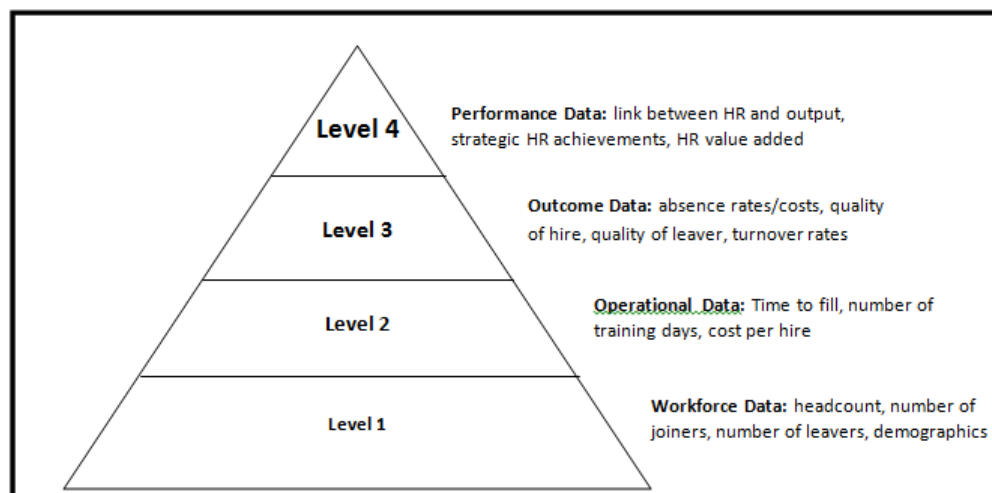
Figure 7.   Human Capital Metrics Hierarchy (From Accounting for People Task Force, 2003)

With the pressures of profit in the private sector, and reducing expenditures in the public sector, the management emphasis is not on the metrics mentioned in the figure above, but on the bottom line. Fitz-enz (1995) states that there is not only the need to "sell" the idea of financial metrics to management, but also the concept of having a measurement system for human capital in the first place. Fitz-enz advocates that the key

goal for human capital managers in today's environment should be to gain a seat at the highest strategic-level table within an organization (Fitz-enz, 1995). This can be difficult to achieve without data and metrics showing the link between human capital management and improved organizational performance (Albeanu & Hunter, 2009).

a.   Establishing Human Capital Metrics

Fitz-enz (1995) argues the following four steps are the key to getting a HRM measurement system off the ground:

- Is there a valid reason for doing it?
- Can it be done?
- Will it create a lot of extra work?
- Is there definitely something "in it" for the organization?

While Fitz-enz offered these four points as the key to developing a measurement system, Toulson and Dewe (2004) identified three barriers to implementing a human capital measurement system: a lack of precision, difficulties in development, and a lack of measurement expertise.

The purpose of establishing a measurement system for human capital is to establish a mechanism for continuous efficiency improvement (Pietsch, 2007). A key way to improve efficiency is to provide accurate metrics and information to decision makers focused on performance results (Kaplan & Norton, 1996a). The following list developed by Vaillancourt (2007) highlights the top ten mistakes made when presenting metrics to decision makers:

- Confusing data with information
- Presenting answers before developing questions
- Measuring activity rather than impact
- Focusing on the HR department rather than the institution
- Focusing on satisfaction rather than success
- Believing more is more
- Choosing the wrong measures
- Being tricked by averages

- Presenting numbers rather than stories
- Failing to move from analysis to action

Since all industries are not the same, approaches in the academic literature should be adapted to a particular industry and organization (Toulson & Dewe, 2004). A simple example of this is that many human capital metrics rely on measures related to revenue and profit. However, in the public sector with the absence of revenue these measurements are not achievable. In the public sector, with the emphasis on cutting overhead and doing more with less, a lack of perspective may occur when using financial figures as the sole measure of success (Niven, 2008).

Grossman (2000) noted that while it is important to understand the up-side of human capital measurement, it can lead to financial myopia. Financial myopia occurs when the organization focuses everything on achieving a certain financial indicator or benchmark at the peril of other areas critical to long-term performance success. In a public service context, this is easier to avoid because there is not a drive to achieve high profits. Yet, especially in times of a constrained economy, there is a drive to cut costs.

Once the organization has considered the points made above, it is time to start selecting the metrics and measuring human capital performance. An important part of developing metrics is to document the metric name, the information required to calculate it, and how to calculate it (Niven, 2008). Creating a data dictionary for all metrics is a simple but important way to ensure long term effectiveness of the metrics used within an organization (Niven, 2008).

b.   *Adding Value through Measurement*

The quote "what you cannot measure you cannot manage" (Bullen & Eyler, 2010) aims to drive home the point that measurement of human capital is extremely crucial. A laissez-faire approach to human capital management and planning is not going to help any organization in the fight for human capital. In 2008, Schwartz and Murphy expressed that the measurement of human capital is so important that all university business degrees should have a subject on the topic (Bullen & Eyler, 2010).

A key barrier to HRM professionals in the private sector getting past the struggle to be more strategic was the lack of skill in measurement techniques; however, eventually this was overcome (Tootell, Blacker, Toulson and Dewe, 2009). Taking the lead from the private sector, larger public sector and government organizations need to have a strategic human capital measurement system in place if they want to achieve the organizations' strategic objectives.

Private industry is currently in an evolutionary phase trying to regulate HRM accounting and human capital investment in order to place it on the balance sheet (Taymoorluie et al., 2011). Public sector organizations are a long way behind in this area and must regress to develop appropriate human capital and workforce management metrics (Tootell, et al., 2009). The key to achieving this is linking together the organization's mission, strategy and human capital planning (Fitz-enz, 1995). By achieving this link, organizations can be much more efficient and effective in recruiting, training and retaining human capital. This will reduce human capital overhead and increase organizational performance, which is aimed at ultimately resulting in workforce planning adding value and not being viewed as an overhead expense.

3.   Strategic Workforce Management

In a resource constrained environment, justification is required to prove that tasks and functions within an organization are adding value to ensure that resources and funding continue to flow in (Becker, Huselid and Ulrich, 2001). This can be proven either by showing a relationship between the task and the bottom line, or a relationship to the organization's strategy (Becker et al., 2001). The following quote by Freedman (2009) further emphasizes this point:

> A workforce plan that addresses economic fluxes, shifting employee demographics and critical talent shortages can allow employers to make smart investments in human capital and proactively manage business risks and costs. (Freedman, 2009, p.10)

Fitz-enz created a simple model called the value-added chain that is a representation of how processes and functions can add value through workforce planning, shown in Figure 8 (Fitz-enz, 1995). The "resource-based view" is also an example of a

model that shows how organizational resources, when used efficiently, can lead to high value-added practices for the organization, illustrated in Figure 9 (Chu-Chen, 2008; Barney, 1991).
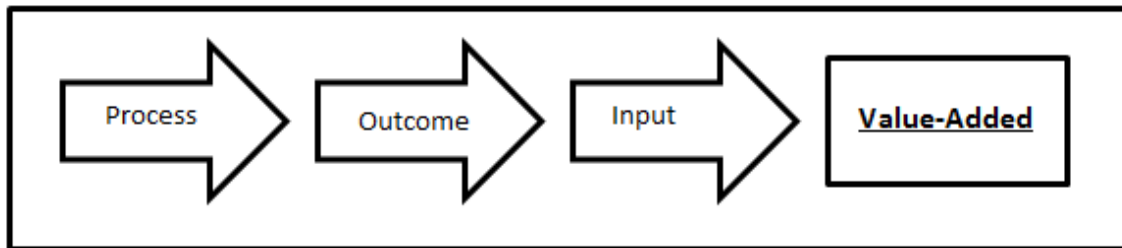
Figure 8.   Value-added Chain (From Fitz-enz, 1995)
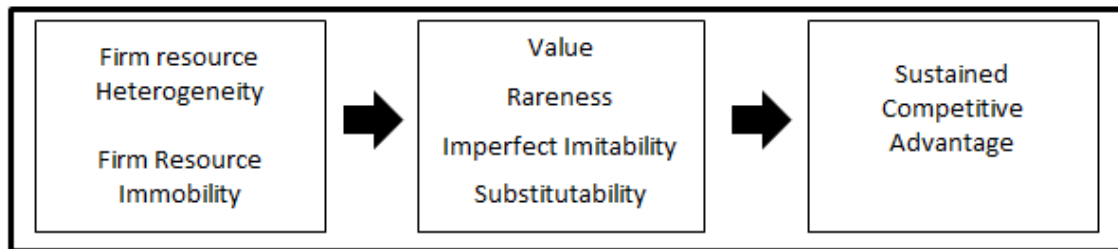
Figure 9.   The Resource Based View (From Barney, 1991)

The problem with Figure 8 and Figure 9 is the models are developed for a single function or process making it easy to create relationships in isolation from the organizational strategy. While these models are good frameworks and they may lead to successful results, the likely outcome, if not managed correctly, is that individual units within an organization use these models in isolation. This creates a disconnect between what a particular unit is focusing on and the overall organizational strategy (Kaplan and Norton, 1996a). When conducting strategic planning, there is a need for centralized planning, communication and control to ensure this disconnect does not occur (Kaplan and Norton, 1996a). A tool to achieve this focus and coordination is the balanced scorecard.

4. The Balanced Scorecard

The book, *The Balanced Scorecard* by Kaplan and Norton (1996a) explains the strategic tool first presented in their 1992 article in the *Harvard Business Review* (Niven, 2008). The Balanced Scorecard is a type of "dashboard" that displays metrics to measure whether the organization is achieving its objectives. As stated by Kaplan and Norton:

> The Balanced Scorecard provides managers with the instrument they need to activate future competitive success. Today, organizations are competing in complex environments so that an accurate understanding of their goals and methods for attaining those goals is vital. The Balanced Scorecard translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for a strategic measurement and management system. The Balanced Scorecard retains an emphasis on achieving financial objectives, but also includes the performance drivers of these financial objectives. (Kaplan and Norton, 1996a, p.2)

Figure 10 is the visual representation of the Balanced Scorecard (Kaplan & Norton 1996a; Beatty, Huselid, & Schneier, 2003). It is split into four business functions: financial, customers, internal business processes, and learning and growth. The scorecard enables organizations to simultaneously track financial results, while building on key capabilities and intangible assets (Beatty et al., 2003). While Kaplan and Norton (1996a) advocate these four sections, it is each organization that must determine what categories are best for its particular operations and business model.
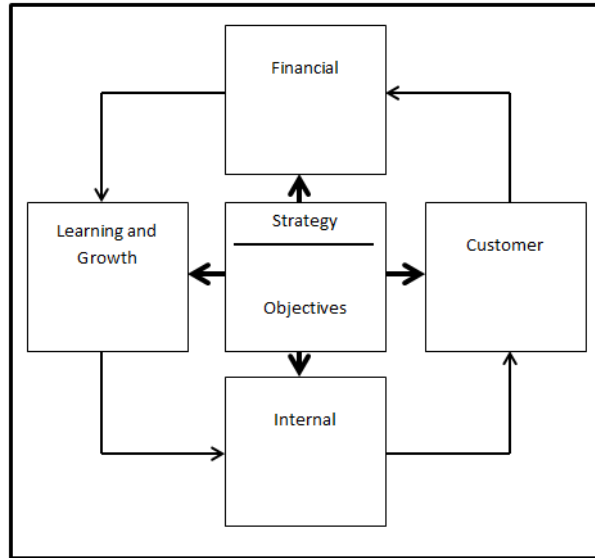
Figure 10.   The Balanced Scorecard Model (From Kaplan and Norton, 1996a)

The Balanced Scorecard is more than a tactical or operational measurement system. It is a strategic measurement system, to control an organization's strategic direction to give it a long term perspective of its operations (Kaplan & Norton, 1996a; Niven, 2008). The performance improvement approach of the Balanced Scorecard is achieved by measurement and analytical skills encompassed in the following steps (Kaplan and Norton, 1996a):

- Clarify and translate vision and strategy

- Communicate and link strategic objectives and measures

- Plan, set targets, and align strategic initiatives

- Enhance strategic feedback and learning

a.   Building the Balanced Scorecard

For public service and government organizations, Niven (2008) advises that when constructing a proprietary version of the Balanced Scorecard from Figure 5, there should be a box for a mission statement at the top of the diagram. While an organization may not be in control of its own mission or the allocation of resources to meet that mission, it is in control of the efficient and effective utilization of its resources. Adding this section to the template constructed by Kaplan and Norton will allow the

organization to keep focused on the mission set by government (Niven, 2008). It also helps keep the organization accountable to this mission, to the government and the tax payer. As well as actually taking positive steps to improve the organization's efficient and effective use of public funds, the Balance Scorecards and other metrics measured will also provide quantifiable proof to the two stakeholders (Niven, 2008).

The Balanced Scorecard can be reasonably straight forward to use if a simple format is used, like the one shown in Figure 11 (Kaplan and Norton 1996b). Especially from the human capital management perspective because most often the mission and organizational strategy has already been established.
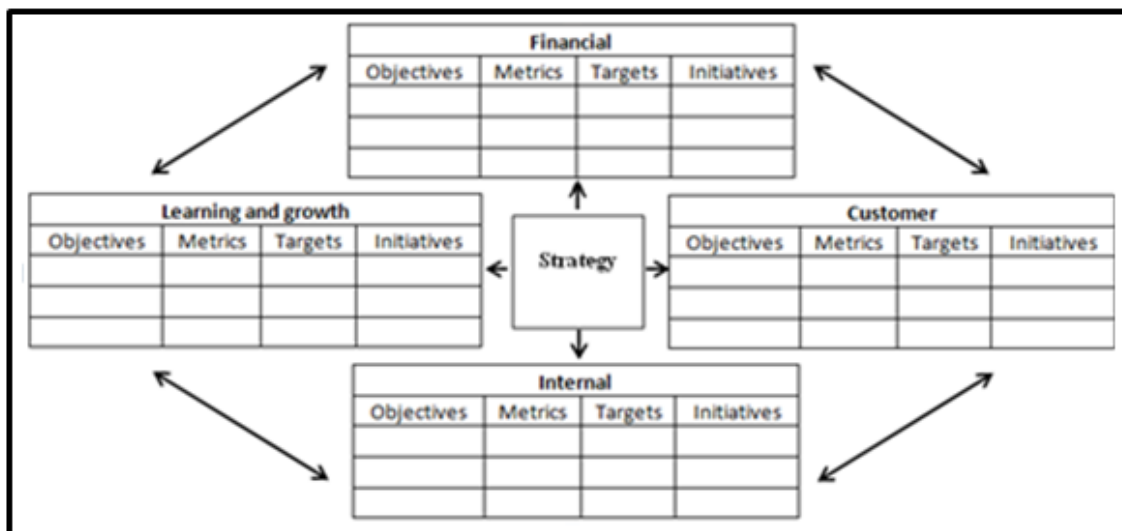
Figure 11.   Balanced Scorecard Template (From Kaplan & Norton, 1996b)

The first step in the Balanced Scorecard process is to develop the objectives the organization believes will help it achieve its strategy. A "Strategy Map" is a tool advocated by Kaplan and Norton (1995a) as a way to help the organization move from its strategy to its objectives by cascading and linking the sections of the Balanced Scorecard. An organization can achieve this linking relationship between its different objectives by using a template such as the one illustrated in Figure 12 (Kaplan & Norton, 1996b). The Strategy Map is about the expected cause and effect relationships to visualize that if the organizations objectives are met it will lead them to successfully

executing their strategy to achieve their mission (Kaplan and Norton 1996a; 1996b). It is for this reason that the objectives on the Balanced Scorecard should not be isolated or independent measures of organizational performance (Kaplan and Norton 1996a; 1996b). This step is usually conducted at the executive level prior to reaching the action stage with human capital management.
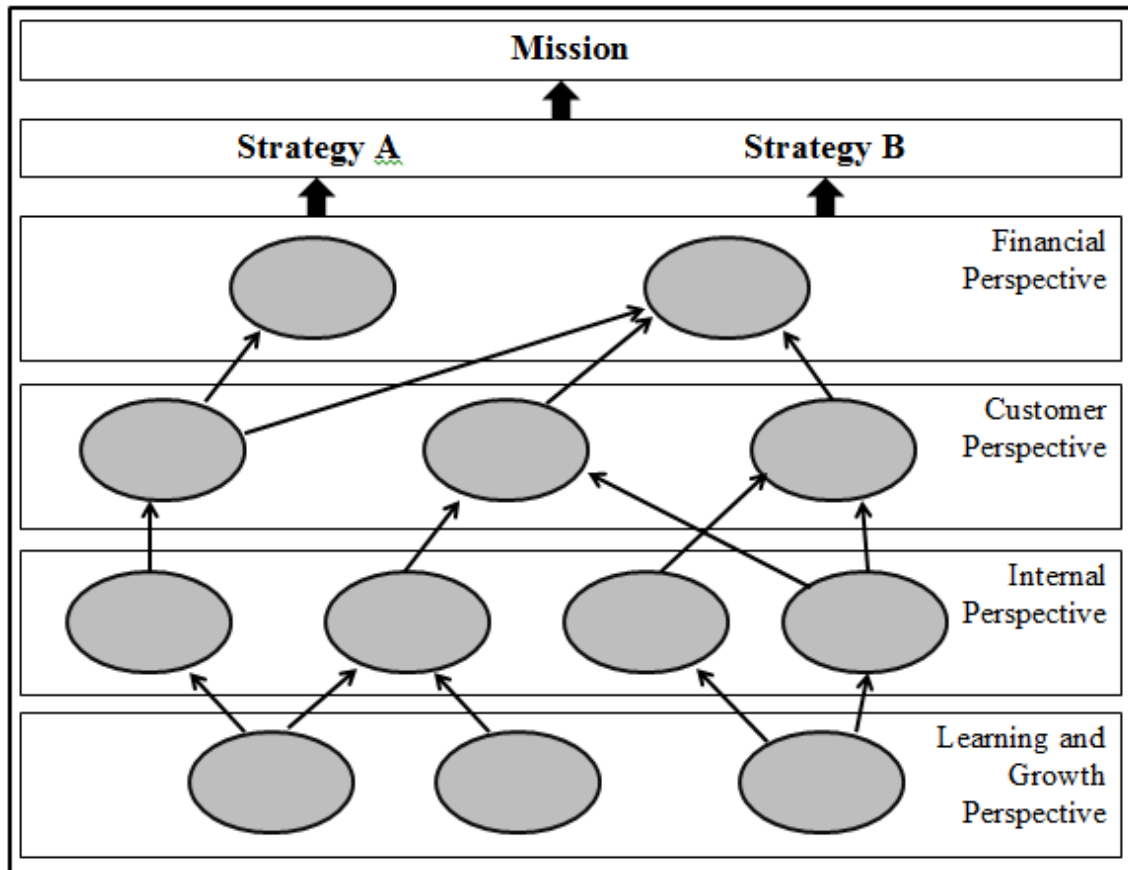
Figure 12.   Strategy Map Template (From Kaplan & Norton, 1996b)

The four different perspectives used in the original template of the Balanced Scorecard by Kaplan and Norton (1992) are financial, customer, internal and learning. A strategy map cascades through these different perspectives to show how the organization's strategy will be achieved, which is the objective of the strategy map regardless of the perspectives that are used (Kaplan & Norton, 2004). For government

organizations, it may not be clear who the customer is. Therefore, this element can be substituted for by a perspective that better reflects the organization. For example, customer perspective can be changed to the stakeholder or governance perspective (Niven, 2008; Barkdoll, 2000).

Once the objectives are set, the organization must decide on the metrics it is going to use to measure the progress of those objectives (Kaplan and Norton 1996a; 1996b). If the organization has a clear understanding of its operations it can set metric targets at the time the metrics are developed. New organizations may need to first move through a business cycle, set an internal benchmark and then set targets (Kaplan and Norton 1996a; Niven, 2008). A good way to overcome this issue is to use external benchmarks from organizations with similar environment conditions and operations (Keehley & Abercrombie, 2008). Alternatively the organization can benchmark human capitals metrics against competitors the organization is directly battling to secure and retain human capital. This can be achieved by using publically available information or by having an information sharing agreement with other organizations. In the public sector this is easier than the private sector because of the more collaborative and less competitive environment (Keehley & Abercrombie, 2008). Benchmarks will also help put internal metrics into perspective by capturing environmental conditions present in the economy and public service area (Albeanu & Hunter, 2009; Giehll & Moss, 2009).

When trying to select metrics to measure and benchmark, the type of metric needs to be selected with the focus of being predictive (Kaplan & Norton, 1996a; Tootell et al., 2009). The majority of metrics initially used by organizations are lag indicators based on solely historical information (Kaplan & Norton, 1996b). While they tell about the past, they have limited value in helping an organization know what will happen in the future. When developing the metrics for a Balanced Scorecard, the goal should be to develop as many lead indicators as possible (Kaplan & Norton, 1996b). Examples of lag and lead metrics are shown in Figure 13 (Kaplan & Norton, 1996b).

		Metrics		
	Objectives	Lag Indicators	Lead Indicators
Financial	Improve Returns Broaden Revenue Mix	Return on Investment Revenue Mix Revenue Growth	
Customer	Increase Customer Satisfaction	Customer Retention Depth of Retention	Customer Satisfaction Survey
Internal	Understand Our Customers Create Innovative Products Cross Sell Products	Share of Segment Revenue from New Products Cross Sell Ratio	
Learning	Build Strategic Information Develop Strategic Skills Focus Resources Employee Effectiveness	Revenue per Employee Employee Satisfaction	Strategic Information Availability Strategic Job Coverage Personal Goals Alignment

Figure 13.   Lead and Lag Indicators (From Kaplan & Norton, 1996b)

The value of having the initiatives listed on the Balanced Scorecard is it acts as a visual prompt (Niven, 2008). It is a visual indicator of what the organization is doing to achieve its objectives and therefore its strategy (Kaplan & Norton, 1996b). It can either be an initiative to improve performance or an initiative to measure and track performance. Similar to the problem with the initial availability of targets to place on the Balanced Scorecard, initiatives to achieve the objectives may not be immediately available. However, over time, the organization should plan to add and manage these initiatives on the Balanced Scorecard (Albeanu & Hunter, 2010).

b.   Benefits of the Balanced Scorecard

A U.S. Governmental Accounting Standards Report found that 70% of government organizations were performing more efficiently since implementing a Balanced Scorecard in their organization (Niven, 2008; GASB 2001). The clear advantage of the Balanced Scorecard is having a path from the ground level to the top of the organization that is moving towards the mission the organization has set to achieve (Kaplan and Norton, 2004). The story told by the strategy map and the Balanced Scorecard describes how an organization is operating to give legitimacy to its strategic decisions, with the metrics able to show the successes or failures (Niven, 2008).

Rather than the organizations focusing on one initiative the Balanced Scorecard helps guide strategic planning across all elements that are important (Niven, 2008). Each section of the Balanced Scorecard represents a key cause and effect relationship of how the organization performed without leaving out important areas critical to success or failure (Niven, 2008). Often human capital management is an area that is seen as important. But, a lack of focus on the area will mean it does not receive the focus, or resources it requires (Fitz-enz, 1995; Becker et al., 2001). The Balanced Scorecard is a tool to guard against this issue (Kaplan & Norton, 1996a; Becker et al., 2001).

The Balance Scorecard illustrates the areas where value is being added by linking the cause and effect relationships between human capital objectives and organizational performance (LeBlanc et al., 2000). If the organization does not achieve its human capital objectives, or organizational success is not achieved, the measurement system should be used to hold management accountable.

Using the Balanced Scorecard, organizations will be able to avoid a common downfall of metrics in human capital measurement. The Balanced Scorecard guards against myopic sub-optimization which occurs when organizations focus on the performance of a single metric (Grossman, 2000; Tootell et al., 2009). This can happen due to a lack of measurement expertise, fixation on a particular metric or the over-emphasis of bottom line financial figures (Kaplan & Norton, 1996a).

The Balanced Scorecard is not a tool that will focus on just the operations or profit-making function of an organization. Although it is important to analyze these areas, if it is done in isolation, the organization loses focus of what is happening in other value adding areas of its operations. It is extremely important to include human capital in the strategic measurement and dashboard initiatives in all organizations (Flamholtz, 1974). Organizations can intuitively understand the relationships between human capital and performance, but the Balanced Scorecard metrics are the link between "feel and fact" (Flamholtz, 1974).

During economic downturns, organizations often lose focus of this intuitive feel and cut back resources invested in human capital to redistribute it to other areas of the organization. By having the value-added perspective clearly illustrated through a strategy map and measured on the Balanced Scorecard, organizations can make more informed decisions about the allocation of resources (Becker et al., 2001). It may still be the correct decision to cut back resources allocated to human capital investment, but the decision will be much more informed and calculated by having the link between human capital and performance illustrated on the Balanced Scorecard (Becker et al., 2001).

Niven (2008) suggested that public organizations can use the metrics and their cause and effect relationships on the Balanced Scorecard to help secure additional resources and funding. By establishing a proven track record of performance improvement the organization will have the trust of the government to secure additional funds for further improvement (Niven, 2008). The metrics will also be immensely important when building a cost benefit analysis to request these additional funds by providing evidence that either performance will improve or that future cost savings will occur (Ulrich & Brockbank, 2005; Lawler & Mohrman, 2003).

c. *The Balanced Scorecard in the Public Sector*

Although the Balanced Scorecard was developed for the profit making sector, the principles and applications of the Balanced Scorecard can easily be adapted to public sector and government organizations (Kaplan & Norton, 1996a; Niven, 2008). The strategy map and Balanced Scorecard created by Kaplan and Norton (1996) can be adapted and categories on the scorecard can be changed to meet the needs of the organization, and environment within which it operates. The United States government recognized the need for performance measurement and governance controls in 1993 when it implemented the "reinvent government" initiative to help measure government performance and create accountability (Osborne & Gaebler, 1992; Kaplan & Norton, 1996a). The initiative, under the leadership of Vice President Albert Gore, led to the National Performance Review (U.S. Government Report, 1993), which saw the following

recommendations implemented by the U.S. government (U.S. Government Report, 1993):

- All agencies will begin developing and using measurable objectives and reporting results
- The objectives of federal programs will be clarified
- The President should develop written performance agreements with department and agency heads

This focus on the link between strategy, performance and accountability is something that public service and government organizations should be trying to achieve. The Balanced Scorecard is a viable mechanism to help achieve this (Niven, 2008). There are opponents of the Balanced Scorecard, especially for its use in the public sector. However, if the organization selects the Balanced Scorecard, the measurement and dashboard system it does use should link human capital to the performance of the organization (Osborne & Gaebler, 1992; U.S. Government Report, 1993; Kaplan & Norton, 1996a). Strategic management expect Peter Drucker advocates this view because government organizations must rely on as much information as possible to make correct decisions from the top down (Drucker, 1990; Niven, 2008). The flow of information will ensure government organizations have the best opportunity to achieve their missions, and provide the best advice for government to make decisions about the future of the organization (Drucker, 1990; Niven, 2008).

5.   Lean Human Capital Management

As established through the literature and presented in the section above, there is a clear need to link human capital management and organizational strategy although the objective link between the two is not always easy to illustrate (Albeanu & Hunter, 2009; Naveh et al., 2007). The essential element is the need for objective, clear, timely and relevant data that can provide reliable information on the effectiveness and efficiency on how human capital is adding value to organizational performance (Flamholtz, 1974). This is where the use of a measurement system has true value to the human capital investment by getting the required metrics onto the Balanced Scorecard (Lepak & Snell, 1999, Cappelli, 2009a; Giehll & Moss, 2009; Giehll, 2011).

Tracking human capital data enables an organization to anticipate trends, monitor critical training phases and fully understand its human capital supply and demand situation across the whole organization (HR Focus, 2005). This internal tool helps understand the availability, flexibility and estimated costs of human capital that is required to achieve the organization's strategy (Cappelli, 2009a). Once this information is available, gaps in the system can be identified and fixed using change and improvement tools found in the field of operations management (Albeanu & Hunter, 2009).

The operations management field has established sound methods through years of operating lean manufacturing and supply chain processes by using two principle methods based on data collection and analysis (Pande et al., 2002). The first is supply chain management and the second, inventory management. Both methods require the implementation of a measurement system and subsequent information technology support management (Albeanu & Hunter, 2009; Giehll & Moss, 2009).

The implementation of a human capital measurement system in the private sector may be easier because of the drive to increase profits through performance tracking (Kamph, 2007; Giehll, 2011). However, it may be argued that with bureaucratic organizational structures and internal supply chains, public sector organizations are more compatible with operations management techniques to measure human capital efficiency and effectiveness (Giehll, 2011; Kamph, 2007)

6.   Supply Chain Management

Supply chain management has been a successful operations management process in manufacturing and retail industries that helps improve profitability and efficiency for organizations that keep any type of inventory (Gresh, Connors, Fasano & Wittrock, 2007; de Kok & Graves, 2003; Voß & Woodruff, 2003). By tracking the production or transfer of material into end products, organizations can understand potential shortfalls in raw materials, inabilities to meet forecasted demand, bottleneck points and other production problems (Cappelli, 2009a, 2009b; Gresh et al., 2007; Giehll & Moss, 2009). A supply chain model can include costs per step, time in each step, total cycle time for completing

one unit, substitution possibilities, time lags, capacity constraint limits, and other related factors (Giehll & Moss, 2009).

The steps of supply management in production and manufacturing have many comparisons to training and internal labor markets. It is surprising more organizations, especially those in the public sector, have not used supply chain management to manage their human capital (Giehll, 2011; Giehll & Moss, 2009). The use of supply chain management improves production processes resulting in each unit on average being produced more efficiently than if supply chain measurement were not implemented (Gresh et al., 2007). In reference to the use of supply chain measurement in human capital management Giehll believes:

> We are literally in the infancy of Human Capital Supply Chain management. But the positive impact that it promises to the business world is astronomical. (Giehll, 2011, p.25)

Workforce planning is defined by management academic Peter Cappelli as having the right person, in the right job, at the right time, and at the lowest possible cost (Cappelli, 2009a). While the definition of manufacturing supply chain management is having the right inventory, at the right time, in the right place, to provide the product to the customer at the least cost to the organization (Giehll & Moss, 2009).

Obviously the parallel between human capital management and supply chain management is clear, but what is not clear is why more public organizations with human capital that is predominantly developed internally are not using more inventory management and supply chain management techniques (Cappelli, 2009a). The fact is that regardless of whether they measure it or not, organizations have a human resource supply chain system in operation to manage human capital. What is advocated by human capital experts is that the organization's human capital supply chain needs to be mapped out, measured and managed (Giehll & Moss, 2009).

Giehll and Moss (2009) define the steps in a human capital supply chain as the business processes to hire, fire and train an organization's human capital. They believe that human capital supply chains link business strategy, business performance, strategic

workforce planning and staffing for improved corporate financial management and greater business success (Giehll & Moss, 2009).

a.   *Benefits of Human Capital Supply Chain Management*

The biggest advantage of using human capital supply chain measurement techniques is it will point to mistakes made in the organization's human capital management approach (Cappelli, 2009a). It will focus the organization on areas not operating efficiently in order for them to work towards correcting these mistakes. These corrections can become a competitive advantage for the organization by limiting mismatches between human capital supply and human capital demand at each level within the organization (Cappelli, 2009a).

Using a human capital supply chain approach more aligned with the "just-in-time" inventory model used by manufacturing organizations guards against hiring above required levels and expects enough human capital is maintained to get the job done. Having a "deep bench" is a flawed strategy because it is extremely costly. Also, unlike other forms of inventory, human capital will not stay with the organization if it is not being utilized (Cappelli, 2009a). With a supply chain measurement system, an organization can more accurately measure the mismatch costs of both undersupply and oversupply (Cappelli, 2009b).

The gap between human capital management and strategic management closes if there is the ability to communicate in common business language and not exclusively HRM language (Fitz-enz, 2007). Changing terms, such as turnover and induction length to human capital wastage and lead time, starts to add impact and legitimacy to the resources allocated to human capital management. This is key in the public sector with its bureaucratic lines of communication. All the parts of the human capital supply chain will be able to work together to implement, manage and improve the whole process when there are clear lines of communication.

b. *Industry Examples*

While there are many benefits of having a supply chain measurement approach, one of the biggest disadvantages is the cost of the technology to generate the information required to make decisions (Giehll, 2011). This is definitely a decision point for smaller and medium sized businesses because the information generated may not lead to the positive expected value from the investment cost of implementing the measurement initiative. For larger organizations the initial outlay in the technology will most likely bring balanced or positive returns as evidenced by the experiences at IBM and Capital One (Giehll, 2011).

The company IBM saw a change in its core market of building computers and took the drastic step of changing its product and whole operational approach when it moved into business consulting. A key factor of IBM's transition from production to consulting was the company's use of its internally developed program called the "Workforce Management Initiative" (Gresh et al., 2007). The initiative was essentially taking the same production and tracking systems used for building computers and applying them it to human capital. As referenced in Gresh et al. (2007), IBM states that the "Workforce Management Initiative" is:

> …a series of strategies, policies, processes and tools which enable optimal labor deployment built on a foundation of learning. (Gresh et al., 2007, p.251)

The United States based Capital One credit card company uses sophisticated analyses of customer data and marketing information to maximize its profits and offer the best service to its customers. When the vice-president of Capital One needed to improve human capital management, he turned to the same marketing, data analysts and change experts that helped facilitate the customer service data-mining (Cappelli, 2009b). Capital One improved its human capital by modeling employee satisfaction, attrition rates, internal hires, external hires and promotion rates using an open market software called "PeopleSoft." This helped improve efficiency, and provide management with objective metrics to measure the value of the workforce planning process (Cappelli, 2009b).

7.   Six Sigma

Six Sigma management is a tool kit of techniques developed by Motorola to improve its production processes to eliminate defects in its production system. (Albeanu & Hunter, 2009) The term Six Sigma refers to the target requirement, that is, for a given number of products produced the number of defects will be six standard deviations from the mean. For example, if there are a million opportunities to fail, then the organization expects to have fewer than 3.4 defects (Albeanu & Hunter, 2009).

The 3.4 defects per million opportunities is somewhat of a gimmick, albeit achievable for some production based organizations. However, the true believers in the Six Sigma philosophy see it as a business culture to drive organizations towards efficient and effective performance results rather than a pure target based approach (Lanyon 2003; Fazzari & Levitt, 2008; Albeanu & Hunter, 2009). When Six Sigma becomes a philosophy of quality, its meaning is no longer restricted to the simple 3.4 defects per million opportunities metric. The mature Six Sigma philosophy aims at implementing organization-wide empirical measurement-based strategies for process improvement while embedding itself into the culture of the organization (Albeanu & Hunter, 2009).

8.   Six Sigma and Human Capital Management

The ability for human capital related defects to be limited to only 3.4 per million decisions is impractical. However, applying Six Sigma to human capital management has been achieved with great success by many organizations by focusing on the approach and culture that Six Sigma brings to a process like human capital management (Albeanu & Hunter, 2009).

One organization that has success with the use of Six Sigma in their HRM functions is Raytheon. As quoted by Lanyon (2003), Raytheon had initially embraced Six Sigma in its production processes but looked across the organization to apply the same tools to other areas of the organization:

> The HR function's Six-Sigma projects continue to develop consistent, simplified processes that   decrease   cycle   time,   increase   customer satisfaction,   and   save   the   company   millions   in   dollars.   What   early opponents   may   have   referred   to   as   just   another   passing   fad   is   truly

becoming the way Human Resources, and all Raytheon, does business. (Lanyon, 2003, p.42)

The high variance of human factor processes make it hard to predict outcomes, but as suggested by Albeanu and Hunter (2009), some of the ways to limit the variance to make HRM outcomes more predictable are:

- Automating as much of the process as possible – using automated workflows, validation procedures and other service automation solutions.

- Eliminating inefficient, non-value added steps in a process – opportunities for defects are directly proportional to the number of steps in the process.

- Eliminating bottlenecks within the process

- Using well-defined procedures and processes and training the staff who perform these activities to a very component level.

- Facilitating a good flow of information between all parties involved in the process (clients, stakeholders, employees, and so on).

- Standardizing the process so that the same way of delivering service is achieved in different locations by different teams.

According to Albeanu and Hunter (2009), by using these points an organization can expect human capital management to operate as a more efficient human capital management system which ensures that resources are not wasted. At the same time, the organization has a quantitative view of performance of the process and can highlight areas of continuous improvement (Albeanu & Hunter, 2009).

A recommendation by Giehll and Moss (2009) is to first measure the cost of human capital within the organization to use to able to employ real figures when reviewing areas of improvement in the human capital supply chain. This would include direct costs such as salary and benefits, but also indirect costs of training staff, administration and training infrastructure (Giehll & Moss, 2009).

a.   *Benefits of using Six Sigma in Human Capital Planning*

In world-class organizations, working to improve quality is not an extracurricular activity. It is a minimum requirement. (Albeanu & Hunter, 2009, p.19; Chang, Labovitz, and Rosansky, 1993)

In their 1992 study of the automotive industry, MacDuffie and Krafcik found that at the seventy organizations they studied, those that had lean practices in manufacturing had better HR practices and achieved better results than those who did not (Yeung & Berman, 1997). Pande et al. (2002) report that Six Sigma offers organizations a statistical tool kit that can result in a more efficient and effective organization (Fazzari & Levitt, 2008). As stated by Breyfogle (1999), linking Six Sigma with supply chain measurement will help the organization reduce cycle time, increase customer satisfaction, decrease errors, eliminate wasted effort and improve transaction costs, through the culture of continuous improvement (Fazzari & Levitt, 2008).

Albeanu and Hunter (2009) believe that the following ten items are the core reasons to use the Six Sigma philosophy in managing human capital:

- Create excellence in process delivery
- Reduce defects
- Reduce scrap/increase efficiency
- Create a quality focused mindset
- Benefit from best practices
- Bring clarity to the processes
- Use a structured scientific approach
- Speak the same language across the organization
- Maintain control of processes
- Strengthen the business case

b.   Six Sigma and Supply Chain Management

There is a key link between the use of a supply chain measurement system and Six Sigma when applied to human capital measurement. The Six Sigma approach requires the data generated from supply chain measurement in order to review the process, analyze the data and then improve the process (Albeanu & Hunter, 2009). This can be illustrated by reviewing the five steps in the Six Sigma methodology that are listed below (Albeanu & Hunter, 2009):

- Define
- Measure

- Analyze
- Improve
- Control

B. CASE STUDY: USN ENLISTED ACCESSIONS SUPPLY CHAIN

An example of a public sector organization that has decided to innovate in order to manage its human capital more efficiently and effectively is the USN. The USN developed a team of specialists to manage their Production Management Office (PMO) and the "Navy Enlisted Accessions Supply Chain." Taking techniques used in operations management, the USN is tracking human capital flow to make more accurate recruitment and progression decisions to ensure the right person is in the right job, at the right place, at the right time. This exercise is carried out using resources in a most efficient way. The PMO presents its efficiency metrics and indicators to senior officers using a dashboard as a snapshot of the human capital situation within the organization.

In this section of the chapter, the "Navy Enlisted Accessions Supply Chain" is examined in detail while linking the approach being used by the PMO to the fundamental techniques from management literature on which it is based. The framework, metrics, reporting approach and Information Technology (IT) support systems are all reviewed. Also, the chapter will examine the steps the problems encountered by the PMO and possible improvements that can be made now with the program out of its infancy.

1. The PMO Organization

In 2007, the USN developed the PMO to use data management and analysis to manage and improve the accession number accuracy for each rating in the enlisted sailors' supply chain. The purpose of the PMO is to ensure that the production of sailors is not dramatically under or over fleet requirements. The PMO is about achieving efficiency gains through more accurately providing the correct amount of sailors to the customer, the USN fleet, instead of having over or under supply of sailors. The USN breaks down enlistment supply into 682 different career paths that new recruits can take from recruitment until they are qualified in the fleet. The intent of what the USN was

focused on when the PMO was established and where they hope the system can go is shown in Table 2.

Where the USN started	Where the USN want to go
Fragmented visibility of inventory and demand	Holistic, consistent view of inventory and demand
Stove-piped functions with unique goals	Integrated functions with common goal
Sub-optimized performance	Most efficient path to customer

Table 2.   PMO Intent and Direction

2.   PMO Vision

The USN understands the need to manage human capital effectively while trying to achieve cost savings at the same time is a balancing act. The USN's understanding of its competing priorities is in line with Freeman (2009) and her belief that managing human capital strategically helps balance other areas of the organization. A representation the USN developed to show the balancing act between their competing priorities is shown at Figure 14. The PMO tries to balance cost through an understanding of human behavior, but they also need to meet the manpower requirement set by the U.S. Congress. They are trying to achieve this balancing act while at the same time being influenced by USN policy and budgetary constraints.
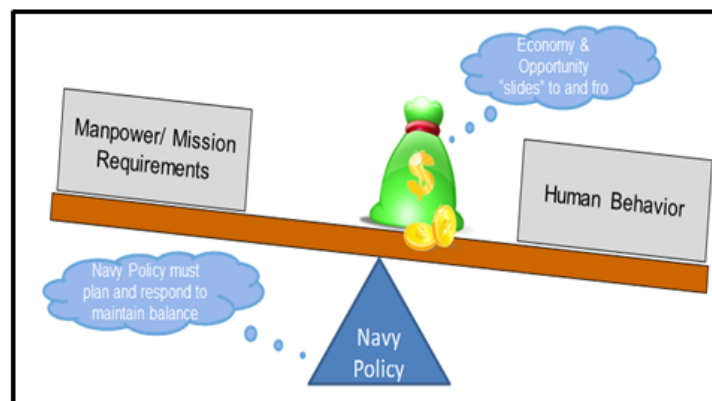
Figure 14.   PMO Requirements and Efficiency Balancing Act

Achieving this balance, while meeting the needs of the customers, and while staying within the constraints of its operations is extremely difficult to do. This seems almost impossible to achieve without a management system strategically managing the key supply chain input, accessions. Based on the principle of what cannot be measured, cannot be managed from Harrington (1991), the USN identified its deficiencies in not managing its internal human capital supply chain for its approximate 330,000 uniformed workforce, leading to the formation of the PMO. The USN has managed to meet its recruiting targets but is increasingly aware of the fight for human capital highlighted by *The Economist* (2006) and the need to retain staff through efficiently progressing them through their internal supply chain.

In establishing the PMO, the primary objective of the USN was meeting its manpower and mission requirements. While meeting this objective, when the system is being managed correctly, the USN foresaw that cost savings could also be achieved. The main methods for achieving cost savings through the implementation of the PMO were the following:

- Plan, respond, and react to trends in human behavior

- Incentives and pay must be in sync with the economy

- Policies must be adaptable, incentive compatible, and geared toward manpower requirements and mission success

3. PMO Objectives

The initial objectives of the PMO were the same objectives that are still in operation. The fundamental themes of the objectives that the PMO operate by are tracking manpower, communication and improvement. Below are the mandated key objectives for the PMO set by the USN executive:

- Build supply chain flow and discipline at the product line level

- Provide visibility and reporting of supply chain operations and keep all stakeholders informed

- Ensure continuous movement of transient personnel

### 4.	Organizational Structure

Based on the objectives of the PMO, the unit aims to achieve the principles of commitment, transparency, collaboration and accountability in order for the USN internal supply chain to operate more efficiently. The PMO is not an authority that can mandate change, but one that facilitates communication and improvements across the organization. The PMO makes recommendations to the stakeholders that make up the USN's enlisted supply chain, e.g., recruitment and training. A key advantage of the investigative and advisory role of the PMO is that it is objective when reviewing the whole enlisted supply chain. The PMO can then advise each element that was previously operating in isolation, how the decisions that they make have follow-on consequences across the rest of the enlisted supply chain. As stated by Fitz-enz (2007), by having a measurement process across the USN human capital supply chain, each stakeholder will be connected by the common language. This open communication and collaboration will further facilitate open lines of communication and efficiency improvement.

An illustration of the PMO organization with the PMO and their principles in the middle is shown in Figure 15. On either side of the figure are the two core functions of the PMO. The metrics function collects data and produce the metrics, dashboards and reports. The operations functions use the material produced by the metrics function to make improvements and recommendations to the supply chain stakeholders and USN executive. The figure explicitly shows how the PMO is able to add value by facilitating policy change through its recommendations, which leads to transient reduction and other efficiency improvements. The need for the PMO to show value-added is crucial to the buy-in that was required to get the PMO established. Fitz-enz (1995) emphasized this requirement to show value-added to get any resources committed to a process.
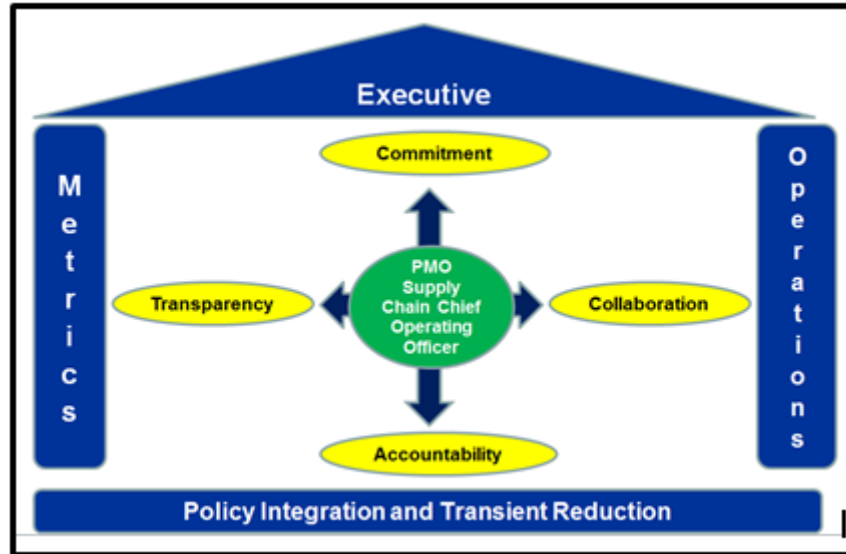
Figure 15.   PMO Organization and PMO Principles

5.   PMO Supply Chain Techniques and Processes

The fundamental technique the USN wanted to use when they implemented the PMO was supply chain management. Specifically the USN wanted to use supply chain management by developing a "Street to Fleet" model. The initial plan for the USN was similar to what was implemented by IBM and Capital One, by taking the core skills of production supply chain management and placing employees in inventory stages (Gresh et al., 2007; Cappelli, 2009b). The fundamental essence of the "Street to Fleet" model for the USN was to be able to track the progression of its enlisted sailor force from the point they are "delivered" to recruit training until they are qualified and in the "journeyman" phase of their career. The USN felt this was necessary to reduce costs and meet fleet manpower demand on time. The visual representation of how the initial USN vision that broke up the Street to Fleet model into career progression milestones are shown in Figure 16.
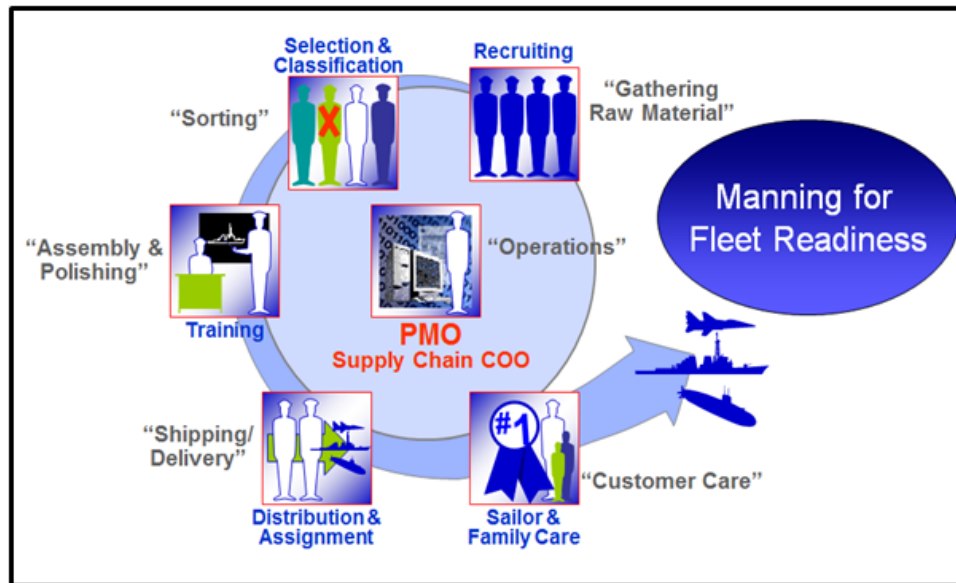
Figure 16.   The USN Enlisted Supply Chain Model

Figure 16 is a basic visual representation of the process that the PMO was established to monitor, review, collect data and recommend improvements, while Figure 17 illustrates a practical representation of the supply chain system the PMO is managing. The end result the USN wants the PMO to manage is meeting fleet demand on-time with limited overages, because overages require additional funding and creates inefficiency. If the USN does not get enough sailors delivered to the fleet they will fail to have the capability expected by government. But, as stated by Cappelli (2009a) it is expensive to have a "deep bench," so the USN does not want to have an oversupply.

The key element that the PMO can manage to meet the fleet demand is accessions; the input at the beginning of the human capital supply chain. Accessions are inserted into the system and flow through the system is in a cyclic nature, along with those sailors already in the system. The flow of personnel through the system is not a discrete process, with Figure 17 illustrating the cyclical nature of the USN human capital model.
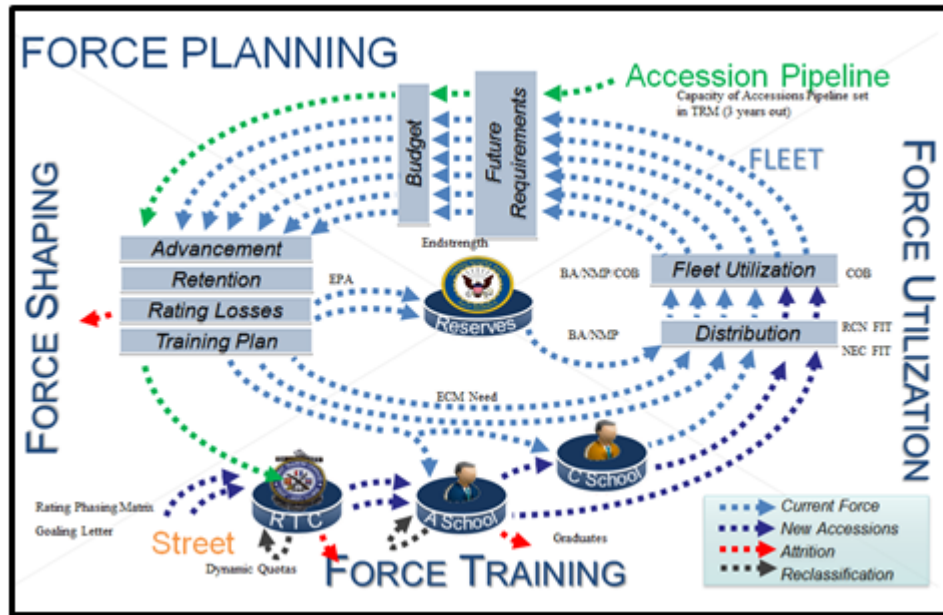
Figure 17.   USN Force Planning Manpower Supply Flow

The PMO has created a process where the complex accession and production planning is more scientific in nature. The metrics and reports the PMO produces open lines of communication and facilitates coordination between the internal supply chain stakeholders. This open communication centers around quarterly meetings for an integrated forum of supply chain stakeholders that gather to discuss emergent issues, strategic direction, and to build risk-informed production plans that enhance the efficiency and effectiveness of the internal supply chain.

6.   PMO "Street to Fleet" Model

Figure 18 is an illustration of the basic steps in the USN's "Street to Fleet" enlisted supply chain model. What the PMO has adopted is very similar to what might be found in the manufacturing industry, and what IBM was able to adapt from computer production to employee production. For the USN, the supply pipeline flows with the sailors being recruited, trained and then distributed to the fleet. During each stage of the pipeline, the sailors will move into a transient state and wait until the next training phase is ready to process them. One of the core functions of the PMO is to analyze the waiting times and develop recommendations of how the waiting times can be reduced. Reducing

the inefficiency of long waiting times provides considerable cost savings and delivers the sailors to the fleet in an expedited manner. The PMO calculates that each non-value adding sailor costs approximately $125 in direct costs per day.
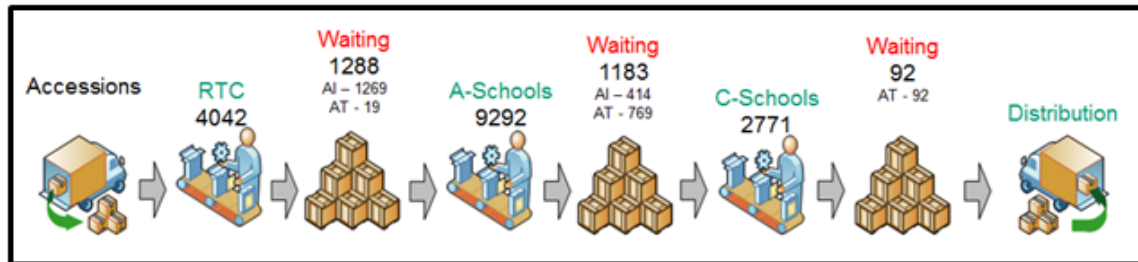
Figure 18.   Accessions Pipeline Model

Figure 18 illustrates the discrete flow of sailors through the "Street to Fleet" model, however the sailors do not always flow through the system in this way. What Figure 18 does not show are the different stages, transient states and decision points that occur in the USN's internal supply chain. Reclassification, attrition and course repeating are all shown in Figure 19.
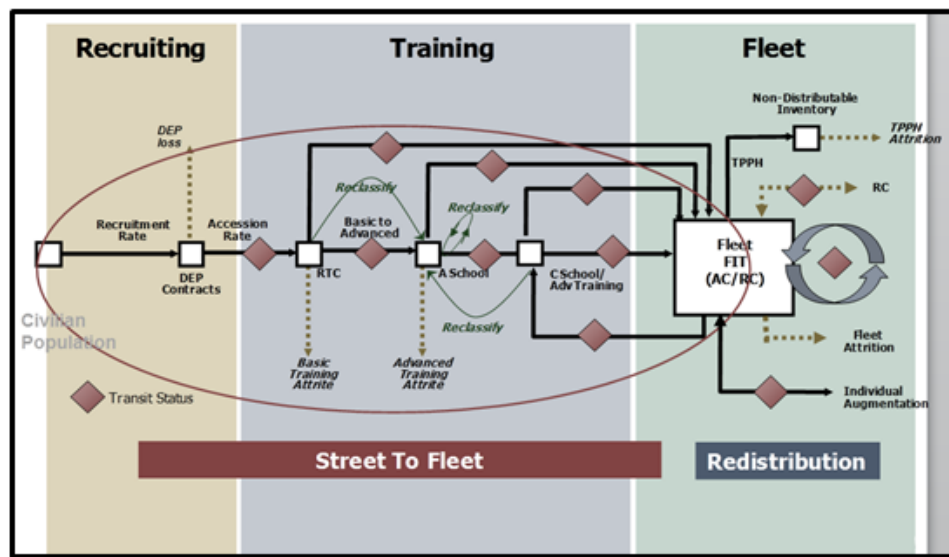
Figure 19.   USN Street to Fleet and Redistribution Model

A major unknown for the PMO is the human nature of each sailor in the supply chain. A decision often made by the sailors is to reclassify and change ratings. Extensive analysis and risk assessment is undertaken when planning reclassification to ensure effectiveness in meeting rating production targets and maximizing supply chain efficiency with respect to qualification reutilization and training. The PMO, by taking this performance management approach, helps them stay on track to meet demand, while also providing sailors with alternative career options. Attrition is another human behavior characteristic that must be accounted for when trying to supply the fleet with the right number of sailors to meet their demand.

The PMO does not aggregate all its data to produce reports based on all sailors in the system. The data is broken down by the 682 different career paths in the USN, or by rating, and each one reported on separately. An example of one classification pipeline and the metrics that are tracked for one particular rating supply chain is shown in Figure 20. The classifications are split up because if they are aggregated the metrics will lack context and will require "drilling down" into the separate classifications to find meaningful information.

Entitlement = 180	59	4	5	2	11	2	9	2	23	12	22	3	5	21
Mean	58	4	8	9	9	4	11	2	24	42	22	3	4	7
Mode	60	2	8	7	7	3	9	1	22	7	22	3	4	0
Std Dev	4	3	4	4	4	3	4	1	6	25	2	1	1	8
Min.	52	1	3	2	7	1	7	1	21	7	18	1	4	0
Max.	71	17	18	21	25	12	26	6	39	97	30	5	6	31
Population	57	57	57	57	57	57	57	57	57	57	57	57	57	57
Lead Days	207	149	145	137	128	119	115	104	102	78	36	14	11	7
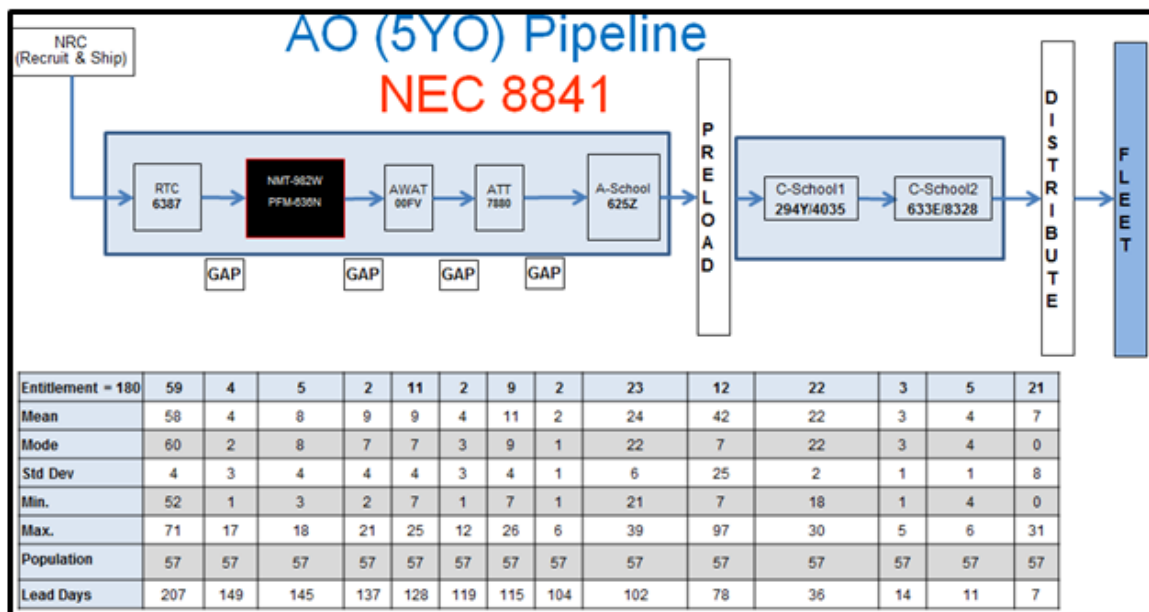
Figure 20.   Street to Fleet Pipeline Example

Using the data from each pipeline report the expected number of sailors that can be supplied at any given time and in what estimated time frame, can be provided to the fleet in accurate detail. The pipeline also helps to clarify the lead time to train personnel in order to meet future demand rather than basing decisions on the ideal time line. Based on the data from each pipeline, the PMO has implemented a tool in 2012 that simulates the pipelines based on historical trends. The PMO can input variables and accession numbers into the simulation tool which will project loss rates, reclassification rates and graduations rates at each stage of the supply chain. This will be a very valuable tool moving forward for the PMO to estimate optimal accession numbers for each classification.

7.   Metrics

It is the role of the personnel within the PMO's Metrics function is to produce the metrics for each pipeline to the Operations function of the PMO. Within the Operations function each Production Line Manager (PLM) has a number of ratings they are responsible for. The PLM will review the pipeline metrics and analyze them for trends and areas of possible inefficiencies. The PLM will then seek further data and drill down to the cause of the problem before making recommendations to the stakeholder of how the inefficiency can be corrected. The function of the PLM is made up of processes very similar to those advocated by the Six Sigma experts (Albeanu & Hunter, 2009; Giehll & Moss, 2009). The USN is following the lead of a competitor for human capital supply, Raytheon, and applying Six Sigma practices to human capital management (Lanyon, 2003).

The PMO reports metrics via dashboards which are presented to the USN Executive and stakeholders. These metrics are what gives the USN Executive and stakeholders a snapshot to review the health of the enlisted supply chain and review efficiency improvement. The remainder of this section will review the key metrics the PMO provides to PLM's and reports in the executive level dashboard.

a.   Target Need vs. Enlisted Community Managers Need

This metric measures the discrepancy between the target demand approved by the USN for the rating in the fleet and the actual number required in the fleet by the Enlisted Community Manager (ECM). This metric is important in evaluating the under and over supply to the fleet based on the USN targeted end-strength goal.

b.   Naval Recruiting Center Accessions

The Navy Recruiting Center (NRC) accessions metric measures if the recruiting goals for the rating are being achieved. It compares the planned recruiting numbers with the number of sailors shipped to recruit training or waiting in the Delayed Entry Program (DEP). This metric is based on quarterly recruiting goals and how successfully they are being met.

c.   A-School Graduates

Enlisted sailors go to A-school to learn the fundamentals of their rating and either progress to the fleet upon graduating, or proceed to C-school to receive further specialized training. The A-school graduates metric is calculated by using the planned number of graduates for the previous three months and nine future months, then divided by the actual number of graduates for last three months and the projected number of graduates in next nine future months. The metric helps monitor if the desired number of graduates is being produced from the A-school phase.

d.   Street to Fleet

This metric is the entitlement "Street to Fleet" time divided by the actual "Street to Fleet" time. This metric is extremely important to the PMO mission because having each rating within tolerance is one of PMO's core objectives. The PLMs primary responsibility is improving this metric for the career paths/ratings they are responsible for managing. It is a fundamental efficiency metric and one of the first that should be measured when analyzing any production chain.

e.   Fit Percentage

The fit percentage is the number of authorized fleet billets that are filled by current on board personnel in the USN fleet that fit the rating and pay band of the position they are billeted into. The metric is calculated by the number of personnel in the fleet that fit their billet divided by the number authorized fleet billets. This metric is possibly the most important metric the PMO tracks because it reviews the end state objective of the internal enlisted supply chain. It answers the question: is the pipeline getting the right sailor in the right place, at the right time. This approach is support by Kaplan and Norton's approach to linking objectives to the strategic objectives the organization is trying to achieve.

f.   Fill Percentage

The fill percentage metric is a metric that highlights if the fleet billets are being filled by enlisted sailors. It divides the number of personnel in the fleet by the number of authorized fleet billets. This metric does not indicate whether the billeted sailor is capable of performing in the billet they are in. With the fit metric capability is implied because the billeted individual has the correct training for the position they occupy. Looking at the end state similar to fit but less specific, therefore the fill percentage has slightly less valuable informational power.

g.   Community Health

The community health metric is made up of current rating occupancy and projected future occupancy in the rating. The current community health is the current number of sailors in the rating divided by the total billets for the rating. The future community health metric is based on a twelve month projection using history trends and reports how the rating is likely to be in twelve months time. If the community health future twelve month outlook is not promising, there is some flexibility to try and remedy this in the next 12 months.

8. PMO Reporting TOOLS and Dashboards

As stated by Flamholtz (1974), metrics and data provides the basis for change based on a systematic approach and not a hunch or feeling. The reporting and dashboards produced by the PMO are critical to change and efficiency improvement in the USN enlisted supply chain. This section reviews the key dashboards and reports produced by the PMO. It also highlights the tools required to produce these dashboards and reports.

The internal and stakeholder reports produced by the PMO lead to the PMO dashboard provided to the USN Executive, illustrated in Figure 21. Each report uses the raw data to create metrics that lead to the executive metrics used on the PMO dashboard.
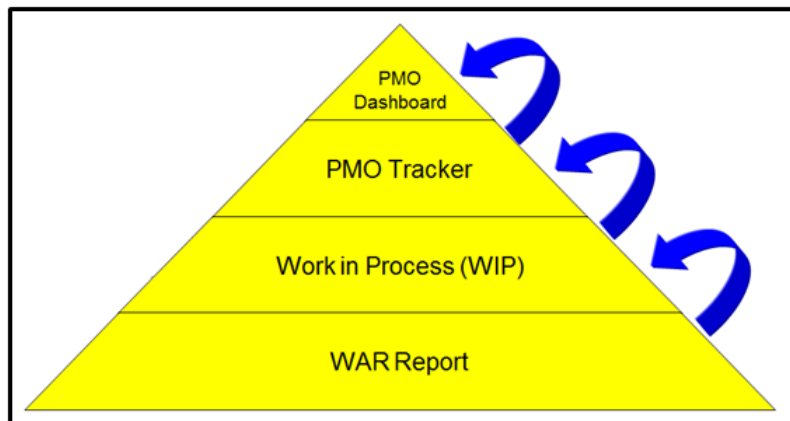
Figure 21.   PMO Reporting Tools Hierarchy

a.   *Weekly Accession Recruiting Report*

The "Weekly Accession Recruiting" (WAR) report is a snapshot of recruiting year group production by rating, program, and gender. This report is generated through daily uploads and reported to stakeholders weekly. The WAR report gives career managers, the PMO, and NRC the ability to track progress towards the yearly recruiting goals and make decisions to ensure goals are achieved. For each enlisted rating the WAR report provides information on the FY goal, recruitment to date, and remaining recruits to be achieved by the end of the FY.

b. Work in Process Inventory Tool

The "Work in Process" (WIP) inventory tool is essential to the PMO tracking inefficiencies and provides PLM's the necessary data to make improvement recommendations to stakeholders. The tool is based on the model shown in Figure 14, and tracks individuals through the "Street to Fleet" model. Data input occurs when an individual moves between states in the supply chain. Individuals are tracked by rating, program, gender, and year group.

The WIP inventory tool requires manual data entry when an individual moves between states; however, the remainder of the systems data and metrics generation is automated. The tool is extremely valuable because it provides a snapshot of exactly where every individual is in the "Street to Fleet" training pipeline, as well as providing data for the PMO dashboard. The WIP inventory tools snapshot functionality is extremely valuable for troubleshooting and answering ad hoc questions regarding the enlisted supply chains. For example, if the fleet is deficient in a critical rating the PMO can give an accurate estimate of when sailors will next be supplied to the fleet and when the rating will likely return to capacity entitlement. From looking at just this one example, it is clear why this is such a critical tool being used by the PMO, PLM's and stakeholders.

c. Accession and Losses Navy (ALNAV) Tracker

The primary focus of the WIP inventory tool is efficiency measurement and improvement, while not considering effectiveness of the system. The role of the Accessions and Losses Navy (ALNAV) tracker is to fill this deficiency by focusing on the effectiveness of the enlisted supply chain. The ALNAV Tracker takes each rating by financial year (FY) and follows that cohort through the pipeline. The tracker provides a snapshot of recruitment, loss rates and delivery to the fleet for each rating FY cohort. A cohort is commonly tracked for thirty-six months or until all members of the cohort have exited the "Street to Fleet" pipeline via delivery to the fleet, or attrition. The data the tracker collects is recruitment numbers, targeted/actual loss rates, targeted/actual

reclassification rates and numbers delivered to the fleet. Figure 13 is a good representation of the ALNAV tracker.

The metrics gained from the WIP inventory tracker does not consider attrition effectively, making the additional metrics gained from the ALNAV tracker valuable supplemental information. If effectiveness were not measured, the system might be achieving its efficiency tolerance, but would not be cost effective if the attrition rate was 50%. By managing the pipeline using the "Street to Fleet" metric from the WIP inventory tool and the effectiveness metrics from the ALNAV tracking tool the PMO's metrics are balanced. As reviewed already, balancing metrics ensures the PMO does not become fixated on a single area of the supply chain that may jeopardize the optimal efficiency of the system.

9.   PMO Dashboards

The primary report prepared by the PMO is the executive dashboard. As per the objectives of the PMO, they report the efficiency and effectiveness of the enlisted supply chain to the USN executive using this report. The layout of the dashboard is shown in Figure 22. As previously stated, and shown in Figure 21, the data and metrics used to prepare the executive dashboard come from the WAR report, WIP inventory tool and the ALNAV tracker. The executive dashboard data and metrics include all the USN enlisted ratings, however there is the ability to report the same data and metrics by individual rating.

The executive dashboard is the USN's version of the Balanced Scorecard developed by Kaplan and Norton (1996a). The difference between this dashboard and the Balanced Scorecard is that the dashboard used by the USN is focused only on the human capital aspects of its operations and not aspects from other areas such as fleet performance or finance. Also the PMO has not explicitly link each metric to specific objectives or strategies via a strategy map or similar mechanism. They have chosen key metrics and graphs that illustrate the effectiveness of each stage of the enlisted supply chain and report these to the USN executive.
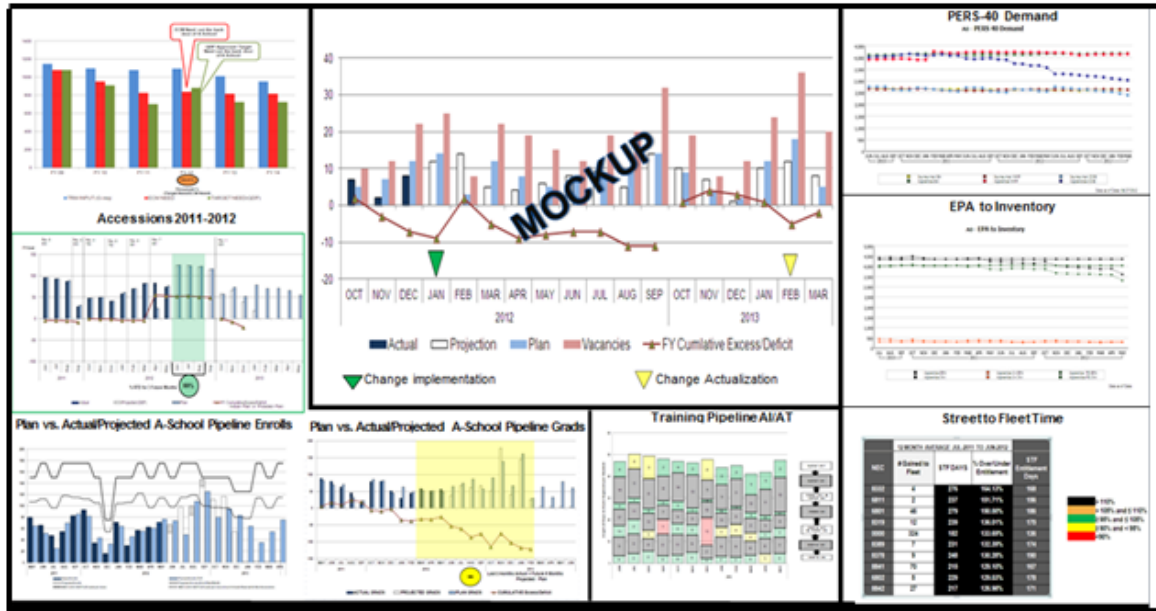
Figure 22.   PMO Executive Dashboard

In the remainder of this section, each element of the executive dashboard will be targeted and discussed.

The ECM versus Target Need graph is based on the ECM versus Target metric previously discussed and is shown in Figure 23. The first bar of each grouping shows the required training inputs that are projected to be required to meet targeted need. The second bar is the number of sailors required by the career managers. The third bar is the targeted number of sailors required to meet end-strength needs. Overtime, the goal of this graph is to show trending efficiency improvement by reducing the gap between the largest and smallest bar in the sets.
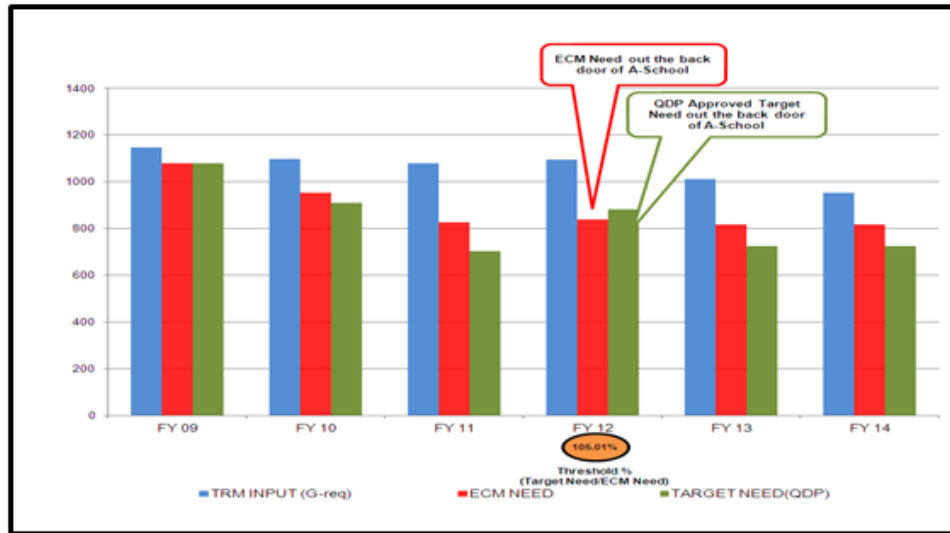
Figure 23.   Target Need Versus Community Manager Need Graph

The target and actual recruitment graph is shown in Figure 24. This graph is a rolling twenty-four month analysis of the prior twelve months' recruiting performance and the projected twelve months' recruiting need. The future planned recruitment need is viewed in relation to the delayed entry program recruits ready to be delivered to recruit training. The line running along each financial year keep track of whether the USN is meeting its planned recruiting goals and is on track to meet the future recruiting goals. Being able to recruit the required number of accession each year is critical to supplying enough sailors to the fleet. This graph is a leading indicator to USN executive that future demand from the fleet is on track for delivery.

The accession summary table breaks down the ratings that are not meeting accession goals, shown at Figure 25. This table is essential to provide to the USN Executive because when reviewing Figure 24, the first question likely to be asked is which ratings have met/are not meeting the recruitment goals. Figure 25 anticipates this question and provides the executive with the answer directly on the executive dashboard.
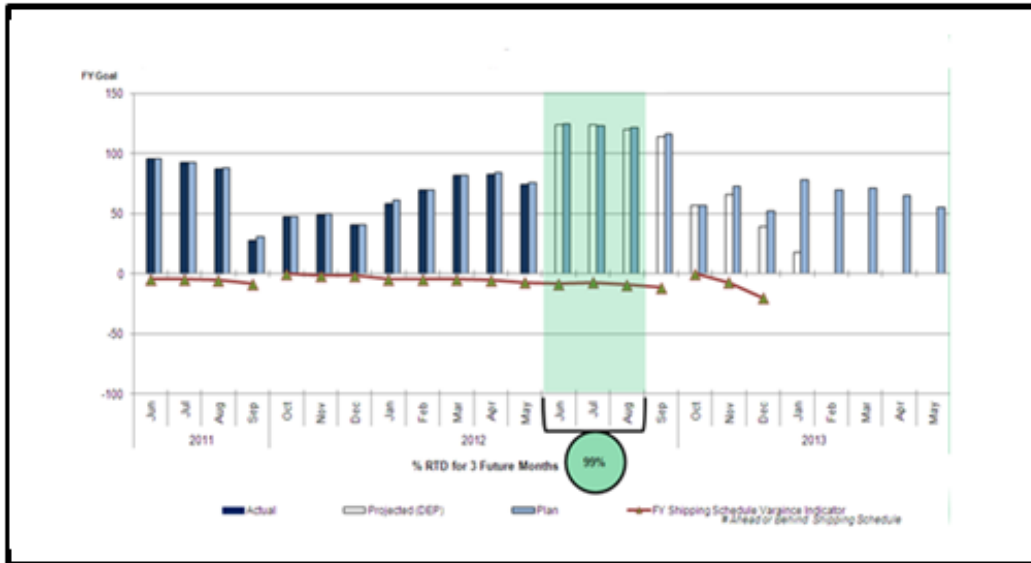
Figure 24.   Rolling Two Year Accessions Graph

Figure 25.   USN Naval Recruit Center Accessions Summary by Rating

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The USN Executive gains an understanding of the efficiency of the training schools and an understanding of the surge capacity of the training pipeline via the planned versus actual training enrollments graph, shown in Figure 26. The bars on this graph review actual versus planned students enrolled for the previous twelve months, and planned versus projected students to be enrolled in the future twelve months. The key information of the graph is the solid line running across the top of the graph. This line indicates the current fixed capacity of the training schools, while the dotted line indicates the planned capacity of the school for accessions. The remaining capacity of the schools is reserved for repeating students or sailors who reclassify their rating.

While Figure 26 is a summary of all of the enlisted ratings, arguably the information presented has the most relevance when broken down by rating. The graph used on the executive dashboard is useful in achieving its purpose of providing a snapshot of training utilization and potential training surge capacity. The surge capacity is extremely important when considering the supply chains constraints and reviewing the costs and benefits of having excess surge capacity built into the supply chain. The requirement for a high surge capacity is reduced when the supply chain is closely managed and understood
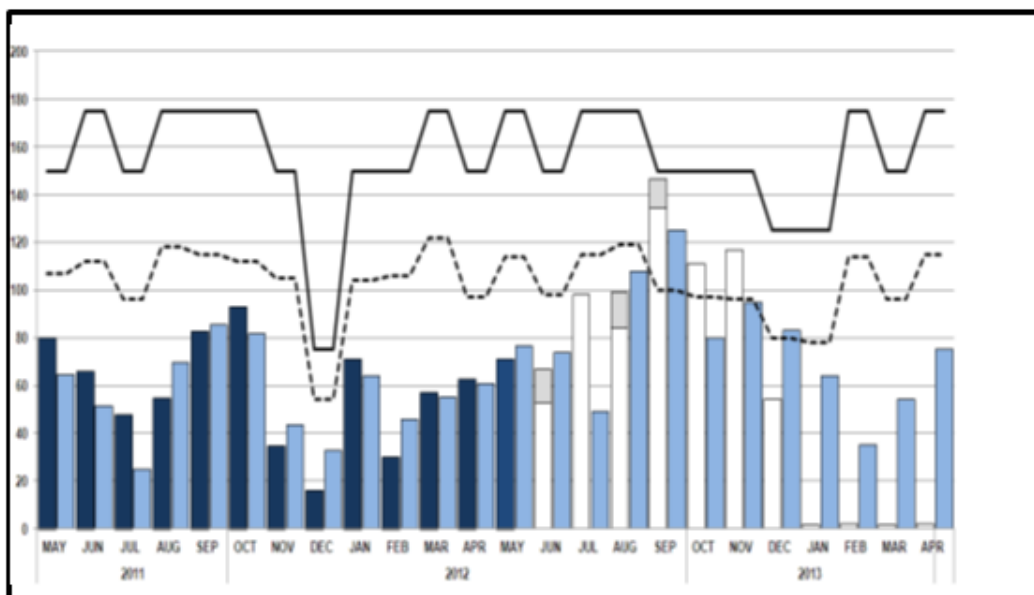
Figure 26.   Planned Versus Actual Training Enrolments

The planned versus actual training graduates graph is based on the A-school graduates metric, shown in Figure 27. It uses the twelve months historical data and projections for the future twelve months that is the planned versus actual graduates. This information is critical in reviewing the ability for the stakeholders to recruit and train the required number of enlisted sailors to meet fleet demand. If actual/projected graduates are below the number of planned graduates it means the supply chain is behind in its production and unlikely to meet fleet demand. Although when investigating this graph the cause for a graduate deficit may in fact be the responsibility of the rating training schools. It is possible the recruitment, recruit training, or time spent in a transient state may be the reason why graduate targets are not being met. Therefore, it is important to review this graph along with the other information on the dashboard.
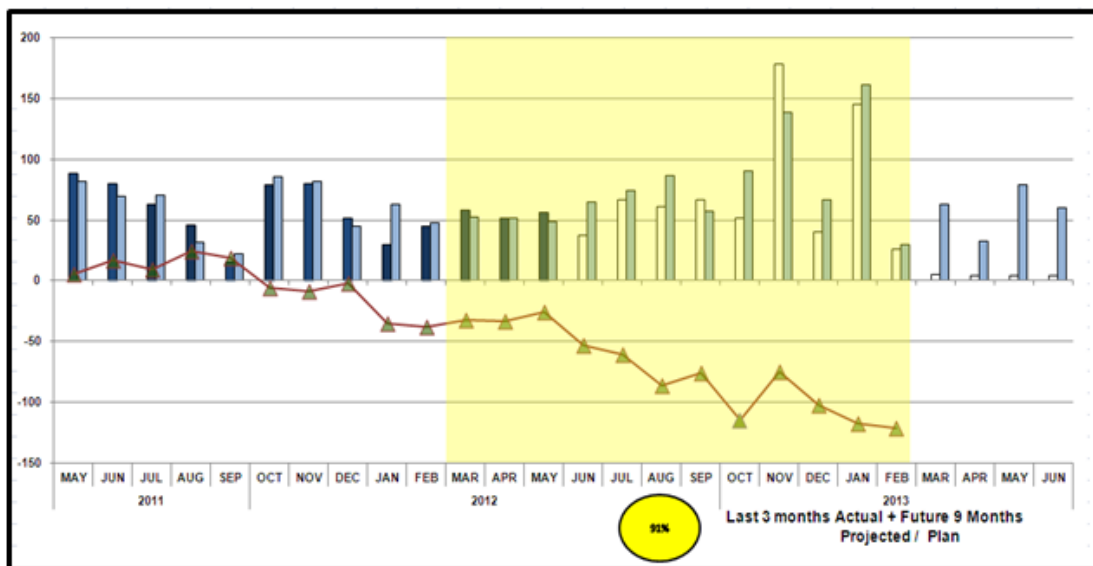
Figure 27.   Planned Versus Actual Training Graduates

The training pipeline graph depicts the average number of days each student who exited a state during a month spent in that stage, shown in Figure 28. The grey segments of each bar in the graph are stages where the trainees are under training. All the other segments of the bars show states where the trainees are awaiting instruction. This graph is useful when used along with the "Street to Fleet" since it illustrates the stages where the bottlenecks or delay in instruction occur.

Figure 28.   Training Pipeline
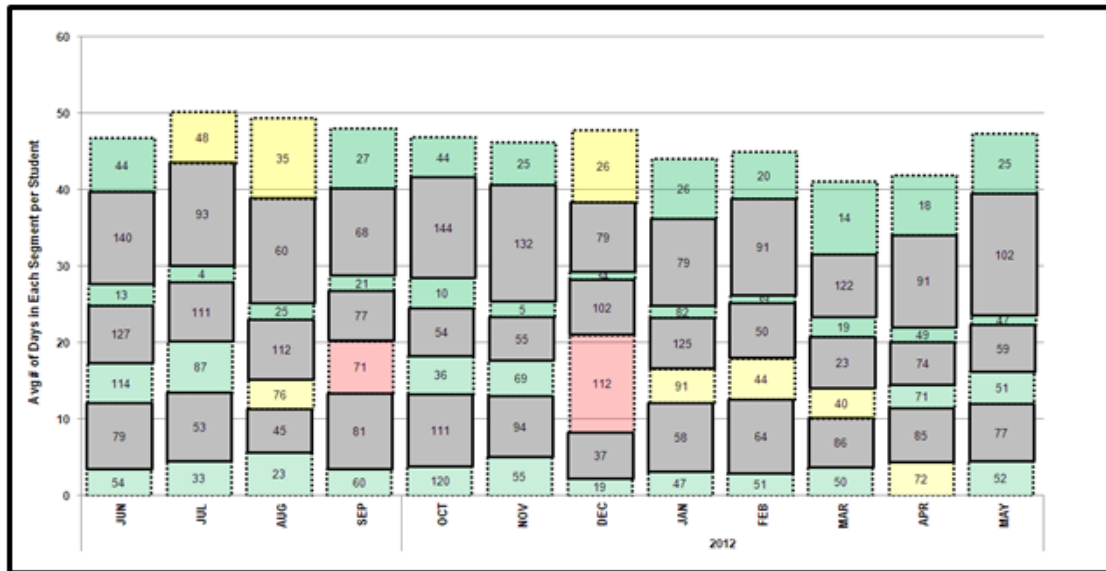
The Enlisted Program Authorisation (EPA) to inventory plot is shown in Figure 29. This graph shows the authorised billets for apprentices across the rating. The graph is broken down with three flat lines showing the authorised apprentice billets in the fleet, in training, and the two combined. The other three moving lines on the graph are the actual numbers of apprentices in the fleet, in training, and the combination total. A sailor is considered to be an apprentice if they are in their first sea tour and still receiving on-the-job training. This graph is important to monitor because it shows the end result of how the training pipeline is supplying the apprentice positions in the fleet. This graph is similar to those of the fit and fill metrics, but instead of the whole fleet it just illustrates the apprentice billets.

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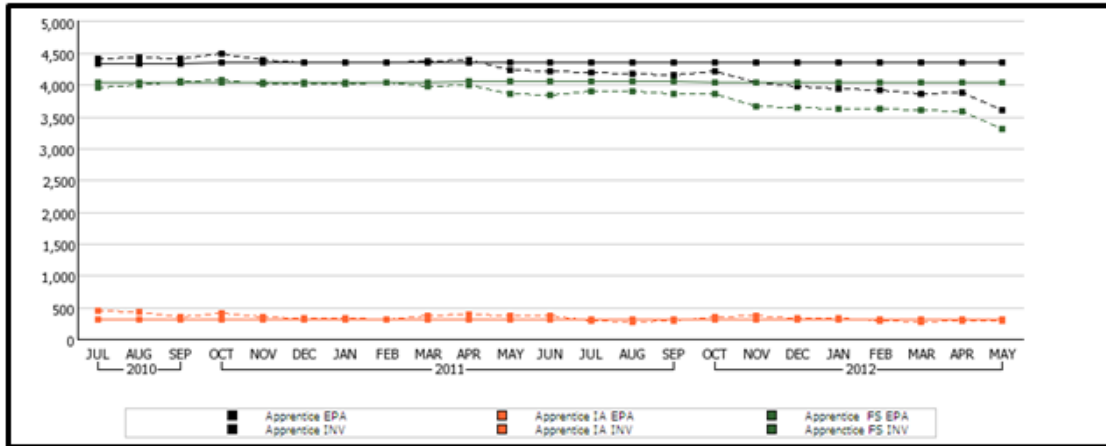
Figure 29.   EPA to Inventory Plot

The graph plotting journeyman versus apprentice authorised billets is shown in Figure 30. The graph has six moving lines across the previous twenty-four months and future predicted twelve months for both journeyman and apprentice billets. A journeyman is a qualified sailor that is no longer in their initial apprentice sea tour in the fleet. For each billet type, the graph plots the authorised fleet billets, the number of billets specified in the fleet manning documents and the number of actual current on board (COB) sailors. Similar to Figure 29, Figure 30 is another way of breaking down and reviewing the fit and fill metrics.

It can be argued that the journeyman metrics are more important to be met because these sailors are qualified and provide valued added work in the fleet. The purpose of the apprentice billets is to grow them into journeyman. However, this is only anticipating the strategic end result that the fleet desires. From a supply chain point of view, the apprentice positions are very important because without the career progression coming from the apprentices there would be no journeymen in the future. Therefore, for current capability the journeyman plots on Figure 30 should be reviewed; and for the future capability the apprentice plots should be reviewed along with most of the other metrics on the executive dashboard.

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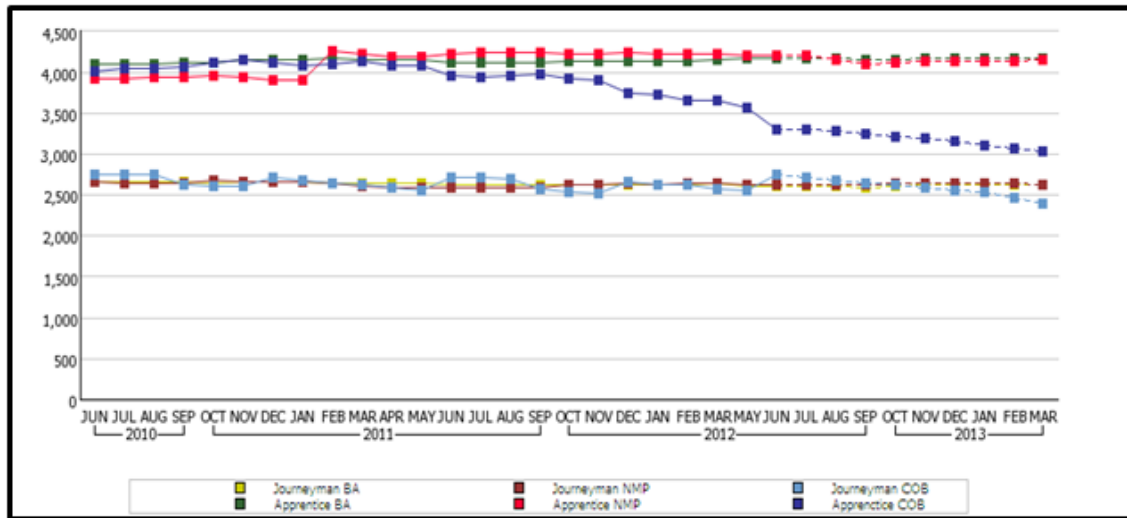
Figure 30.   Journeyman Versus Apprentice Authorized Billets

The "Street to Fleet" table highlights the ten least efficient ratings pipelines in the enlisted supply chain based on the "Street to Fleet" metric shown in Figure 31. The goal of the PMO is to reduce the level to which the worst performing ratings differ from the optimal. Although the "Street to Fleet" time requires an extended period to remedy because of the extended nature of the supply chain, it would be useful to have a trend of the historical "Street to Fleet" metric to show if the rating is becoming more or less efficient.

The largest and central graph on the executive dashboard is the overall production graph, shown in Figure 32. This graph reviews the summary of what is planned to be supplied to the fleet and what was actually supplied to the fleet. The graph reviews the previous three months and future fifteen months of projected production. The first two bars of each set compare actual/projected production with what the planned production target was. The third bar shows the excess capacity within the supply chain to produce more sailors to the fleet.

| EC | 12 MONTH AVERAGE JUL-2011 TO JUN-2012 | | | STF Entitlement Days |
	# Gained to Fleet	STF DAYS	% Over/Under Entitlement	
111	4	276	164.13%	168
222	2	237	151.71%	156
333	46	279	150.00%	186
444	12	239	136.01%	175
555	324	182	133.69%	136
666	7	231	132.39%	174
777	9	248	130.28%	190
888	70	215	129.10%	167
999	5	229	129.03%	178
000	27	217	126.98%	171

Figure 31.   Table of Ten Least Efficient Street to Fleet Ratings

The running line across the graph is the cumulative under or over supply of sailors to the fleet to monitor the overall picture or if the yearly production will be reached. Also on the graph, the PMO plot triangles to represent points in time where significant changes were made to the supply chain to monitor trends that relate to that change. The information gained from this graph is similar to that of Figure 26, except that Figure 26 has the additional information of capacity vacancies that could have been used to produce more sailors if required.
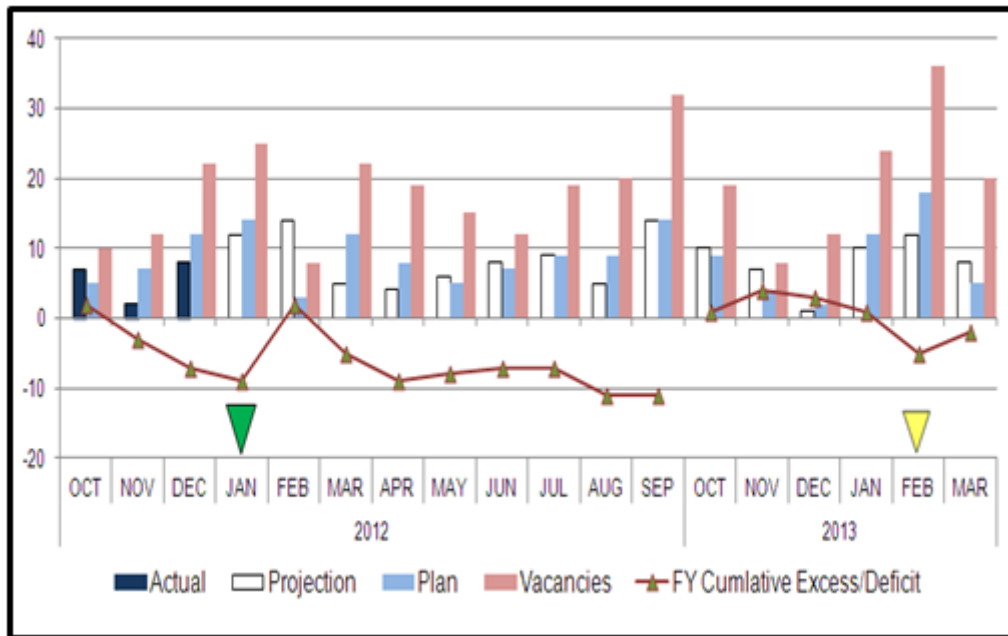
Figure 32.   Overall Production Graph

10.   Flag Level Health Check

The ratings summary is a Flag Officer level summary of six key supply chain metrics, shown in Figure 32. This summary helps provide a quick view of the overall health of the enlisted supply chain based on the tolerance ratings assigned to each metric. The rating summary can be seen as a mini executive dashboard because it contains much of the same information without as much detail or data as the executive dashboard. The source document for the ratings summary automatically tabulates the fields of the table. The source document becomes essential when reviewing which ratings are outside tolerance/threshold.

Scale	Target v ECM Need	Accessions	A School Grads	Street to fleet	Scale	Fill	Scale	INV v EPA
<90%					<80%		<95%	
>90% and < 95%					>80% and < 90%		>95% and < 98%	
>95% and <105%					>90% and <105%		>98% and <102%	
>105% and <110%					>105% and <110%		>102% and <105%	
>110%					>110%		>105%	

Figure 33.   Flag Level Ratings Summary Health Check

11.   Implementation, Problems Encountered and Future Improvements

The PMO is now in a mature state and producing data, metrics, reports and dashboards which are helping the USN conduct its human capital management in a more systematic manner. It has required substantial resources, informational technology acquisitions and specialised training to get the PMO to the state it is currently in. This section outlines the challenges the PMO has overcome and those that still remain

a.   *Informational Technology and Data Entry*

The single biggest challenge the PMO has faced is the acquisition and integration of numerous different IT systems that track, store and manipulate the data the PMO needs to achieve its objectives. Each stakeholder the PMO monitors across the enlisted supply chain had at least one stand-alone IT system that collected the data that the PMO required. The integration of these systems, and/or the process of accessing the data, was the first task the PMO focused on when it was established because of the data critical role the PMO was set up to carry out.

As well as establishing the software behind the data management, the PMO also had to establish processes to monitor the data entry integrity. The data entry integrity for the WIP inventory tracking tool is of most importance because it requires daily data input to provide an up-to-date snapshot of the pipelines. Becker et al. (2001) emphasize the point that at all times management should be planning to make the best decisions by demanding the best available information.

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b.   Cost Accounting

The role of the PMO is to track supply chain efficiency and report metrics to the USN Executive and supply chain stakeholders to illustrate improvement in the system. Since the implementation of the PMO, the Supply Chain metrics have shown efficiency improvement. However, the improvements are only in the context of the metrics themselves. The primary purpose for the enlisted supply chain to improve efficiency is to deliver the right number of sailors to the fleet at a reduced cost. Has the cost of the enlisted supply chain decreased as a result of efficiency improvements, by what amount and because of what improvements? Currently the PMO is not in a position to answer these types of questions.

For the PMO to monetize efficiency improvements, cost accounting techniques must be employed to understand the accurate cost of sailor training, overheads and savings. It would be extremely valuable to know the cost involved to get a sailor from "Street to Fleet" for each rating. It would also be extremely valuable to know the cost of a particular rating school with a hundred student capacity versus the same school with, perhaps, only a sixty student capacity.

If the USN were able to pair the valuable data produced by the PMO with accurate costs of each element of the enlisted supply chain they would be in a greatly enhanced management position. The decisions made related to recruitment, training and retention would be near optimal and significant cost efficiency would be achieved. An example of this optimal decision making would entail an understanding of exactly what retention bonuses to offer personnel since the USN would know the cost to train that sailor's replacement. Moving towards this type of decision making information should be a priority for the USN and the PMO.

c.   Causal Relationships

The data gathered by the PMO is extremely valuable if the USN were to place an emphasis on researching certain cause and effect relationships within its enlisted supply chain. An example may be using the waiting times in between training phases and exploring its effect on retention. Many such exploratory questions could have to do with

the performance of sailors in the fleet, but would then require some form of performance metric to measure the success of sailors in order to understand the relationship between training and performance. A performance related causal relationship that may be considered is measuring the effect class size has on future performance in the fleet.

Similar to the recommendation regarding cost accounting, the data and information the USN now has at its disposal through the PMO tools should be utilized. While cost accounting can improve cost benefit related decision making, understanding causal relationships can improve the human behavior related decisions the USN is required to consider. If the data can support claims and hypotheses about the likely decisions and/or performance of the sailors, then the decision made by the USN will be much easier to analyze.

12. Case Study Summary

The systematic approach taken by the PMO to collect data and manage the delivery of sailors to the fleet has seen efficiency metrics improve since the PMO has been providing information and recommendations to the supply chain stakeholders. Moving forward the PMO should emphasize the need for financial indicators to be added to each element of the enlisted supply chain to allow for optimal decisions to improve cost efficiency and not just metric efficiency. The practical example of the PMO is a very sound and applicable template for the Royal Australian Navy to adopt when developing an internal human capital supply chain management system.

C. CHAPTER SUMMARY

Based on the in-depth review delivered in this chapter, the six steps below have been formulated as a template for public and government sector organizations to implement more efficient human capital practices through measurement. The USN has implemented similar steps to further the PMO. In Chapter III, this thesis shows how the Royal Australian Navy can implement these steps.

1.   Link Organizational Strategy and Human Capital Needs

To ensure there is not a mismatch between organizational strategy and human capital strategy, the organization must understand its environment, mission, and overall strategy. Workforce planning specialists should not move on to further steps without considering these issues. Otherwise, the focus of human capital management will not lead to improved organizational performance.

2.   Create a Strategy Map and Determine Objectives

Using the strategy map concept developed by Kaplan and Norton (1996b), construct the strategy map for the organization. This step illustrates what the organization wants to achieve and the objectives that will help achieve this. Determining the objectives an organization wants to achieve will create important milestones in achieving that strategy as well as improving organizational performance in the long term.

3.   Select Metrics to Measure Performance and Build a Dashboard

Using the principles for human capital metrics measurement selection championed by Fitz-enz (1995) and the dashboard method of the Balanced Scorecard created by Kaplan and Norton (1996a), the organization must select the metrics that will measure and illustrate if it is achieving its objectives. This information will guide an organization towards successfully achieving its strategy by tracking performance as well as providing a snapshot of the organization's human capital situation to allow for the making of informed decisions.

4.   Use a Supply Chain Approach to Measure Human Capital Flow

Organizations that use a large proportion of internal recruitment and promotion will discover that many of the key metrics they will want to appear on the Balanced Scorecard will relate to human capital flow and career progression. By using methods from operations management, the human capital supply chain should be mapped out and tracked to analyze and understand what is occurring with the organization's human capital via a human capital supply chain measurement system.

5.   Use Six Sigma to Achieve Better Results in Human Capital Flow

When a human capital supply chain measurement system is implemented, a large amount of data, metrics and information will be available to analyze with the goal of improving the efficiency of human capital investment. An approach and tool kit to help analyze the human capital supply chain is Six-Sigma. The organization should internally train a group of Six-Sigma specialists to identify inefficiencies in the human capital supply chain and suggest methods to improve them. The intent is to greatly reduce training costs, turnover rates, and time for new recruits to become fully effective.

6.   Develop Policy Related Cause and Effect Relationships

Once the organization is mature in its measurement and analytical approach to human capital management, it can move on to making high level policy decisions with a high degree of certainty. Using econometric techniques, the organization can hypothesize about particular individual or workforce characteristics that should lead to improved organizational performance. The organization can also test whether or not these characteristics have a significant impact. Such hypothesis may be that employees hired out of high school are more loyal to the organization, or tertiary education graduates are promoted at a higher rate than high school graduates. The ability to successfully measure and predict these hypotheses will lead to significant efficiency improvements for the organization.

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III.   PRACTICAL APPLICATION: ROYAL AUSTRALIAN NAVY

Chapter III applies the researched material reviewed in-depth in Chapter II and illustrates how it can be applied to the Royal Australian Navy (RAN). The objective is to consolidate all the learning points from the in-depth review presented in this thesis and answer the research objectives stated at the beginning of this thesis. The objectives were as follows:

- Formulate a general set of steps for implementing a human capital measurement system, accompanying metrics and an executive dashboard

- Examine whether the USN supply chain management model is a valid construct for the RAN to use to manage its human capital

- Outline implementation considerations for a human capital measurement system for the RAN

The steps presented in the Chapter II Summary have been used to describe the process of developing a human capital measurement system. While adapted for the RAN, this process illustrates how any large public sector organization can measure and manage its human capital through a systematic approach.

Before an organization starts to work through the steps to build a human capital measurement system, it first must determine if the project should be undertaken. Fitz-enz (1995) advocates that the organization must ask the following questions before implementing any steps:

- Is there a valid reason for doing it?

- Can it be done?

- Will it create a lot of extra work?

- Is there definitely something "in it" for the organization?

For the RAN the reason for carrying out the project is to be more businesslike in its approach and save resources in an environment where resources are becoming increasingly more constrained. The example of the USN Production Management Office (PMO) proves that the project can be implemented successfully in the military environment. It will create additional work for the RAN; however, the trade-off to this is the gains from implementing a measurement system will outweigh the cost to the RAN.

As part of the Strategic Reform Program (SRP) Navy, Army and Air Force were directed to work together, where possible, and save costs through economies of scale. Before beginning the project to implement a human capital management system, the RAN should consult with the Army and Air Force. Firstly it should be understood if either service is using human capital measurement already. Secondly, the three services should determine if the implementation of the project could be jointly done.

A.   LINK ORGANIZATIONAL STRATEGY AND HUMAN CAPITAL NEEDS

Depending on conditions with the labor market, and as stated by the ADF and RAN in the White Paper, SRP and People in Defence documents, the attraction and retention of sailors is critical to the mission of the RAN. The reason is that the RAN has the strategy to acquire and use the best available technology to fight and win in the maritime environment. Equipment and technology alone are not going to achieve the mission of the RAN. The RAN must have trained, motivated and intelligent young men and women to utilize the technology and equipment on the RAN's seagoing platforms. The management and oversight of the process to recruit, train and retain the RAN's enlisted sailors is a critical objective to the RAN's mission. Therefore, the RAN should be providing the best available information to its senior officers and stakeholders about how it is performing in recruiting, training and retention.

The core focus of the human capital supply chain is the internal supply of sailors through the pipeline to the end customer, the RAN fleet. The role of recruiting and training is to ensure the fleet is adequately manned, that those sailors are sufficiently trained and they are delivered in the required time frame. The system also has to perform this function with limited resources which have been further constrained by the efficiency objectives of the SRP. The changes recommended in this research will help the RAN move forward to innovative in a "tough" market for human capital, as per the People in Defence Strategy (Department of Defence, 2009d).

As stated by Kaplan and Norton (1996a), everything an organization does should have the mission it is trying to achieve as the ultimate end state. In order to achieve the mission, the executive of the RAN has set strategies and established initiatives to achieve

the mission. The RAN needs to use these strategies and initiatives whenever it sets objectives for the organization. Whatever metrics measure its human capital objectives are the metrics the RAN should use.

Summarized from Chapter I, the Australian Government, ADF and RAN have already set the strategic direction for the future. Therefore, when striving to link strategy, objectives and metrics, the explicit strategic intention of the organization should be used rather than assumptions.

The RAN's mission is to fight and win in the maritime environment. Every function, resource, strategy, and objective is focused on this core mission of the RAN. When looking at the human capital requirement, management and measurement for the RAN, everything must flow down from its mission. As stated in Chapter I, the RAN has undergone significant changes since the release of the White Paper, SRP and NGN, in 2009. Also impacting the way the RAN does business is the Rizzo Review released in 2011. These four documents have explicitly shaped the direction of the RAN moving forward. Human capital metrics must focus on measuring objectives of these directives and initiatives.

The human capital objectives of the RAN stem from their management and strategy planning documents, which cascade down from the White Paper. Therefore, when this research is focused on developing an approach to measuring and improving the efficiency of the internal human capital supply chain, it is these documents that set what is important to measure. As stated by Vaillancourt (2007), it is extremely easy to focus on a metric or financial indicator that has nothing to do with the actual efficiency, effectiveness or value added role of the human capital supply chain. The metrics need to focus on value added areas based on the resource-based view of Fitz-enz (1995). Therefore, if the organization's strategy is to have a trained and motivated force to man its fleet, then that is what needs to be measured.

The White Paper has a high level of significance because it sets the future direction of the organization and sets the human capital need to achieving the desired force in 2030. The White Paper and its long term objective for human capital, emphasizes

the overall sustainability of the workforce and the training pipeline. Human capital strategy, based on the White paper, is recruitment, training, retention and continual learning.

Currently, the biggest strategic challenge facing the human capital supply chain is the cost of the force. The SRP has directed that the RAN become more efficient at performing its function. The RAN needs to develop ways of producing and retaining sailors at a lower total cost than it currently does. Efficiency improvements and developing new ways of doing business should be a key priority for the RAN.

The release of the Rizzo Review has put pressure on the RAN and DMO to acquire and maintain the RAN's major fleet unit more successfully. The recommendations from the Rizzo review had many implications on the role human capital plays in the successful maintenance of the RAN's platforms. Efficiency and effectiveness of the pipeline to get sailors to the fleet, is just one priority. The White Paper, SRP and the Rizzo Review have also made quality and performance of sailors into objective requirements necessary to achieve the RAN's mission.

Since being implemented by the previous Chief of Navy (CN), New Generation Navy has been at the forefront of the strategic focus of the RAN. For human capital management it is about improving culture, leadership and performance to translate it into higher motivation and subsequently retention.

Given that the RAN has either been directed to or has expressed a desire to focus on human capital issues, the RAN should be tracking and monitoring their progress. To do this, metrics should be designed to focus on the mentioned strategy issues. These metrics should then be presented in dashboards relevant to the stakeholder's different interests in the internal human capital supply chain and delivery of sailors to the fleet.

B.   CREATE STRATEGY MAP AND DETERMINE OBJECTIVES

As championed by Kaplan and Norton (1996a), all measurement and metrics must be linked to strategy. The primary tools Kaplan and Norton use to do this visually are Strategy Maps and the Balanced Scorecard. The RAN should use a Strategy Map to focus the organization on the human capital objectives that are critical to achieving the RAN's strategy and mission. Based on the information in Section A of Chapter III, a human capital strategy map has been developed through this research and shown in Figure 34.

The Balanced Scorecard championed by Kaplan and Norton selects objectives and then metrics from all areas of the organization. However, as in the USN, this research has shown that human capital can be separated from other areas for the organizations operations. There is no overwhelming reason why human capital and internal human capital supply chain issues cannot be presented to the RAN executive separately from other areas. The RAN is expected to understand its own operation and seek the data, metrics and information they require to make decisions.

This research has intended to make very few assumptions about the RAN's strategy, objectives and external environment. The Strategy Map developed is based on the explicit intent expressed in the RAN's main strategic documents. The Strategy Map has been developed based only on objectives related to human capital and internal human capital supply chain progression. When the RAN reviews the implementation process for its measurement system, this Strategy Map should be used as a starting point.

The fundamentals of the Balanced Scorecard are being used by the USN, and 70% of organizations that use the tool report positive results (Niven, 2008). Therefore, the Balanced Scorecard and Strategy Map are valid tools for the RAN to use as templates to ensure that the metrics they select are valid. Kaplan and Norton state the following benefits are gained from using their tools (Kaplan and Norton, 1996a):

- Clarify and translate vision and strategy
- Communicate and link strategic objectives and measures
- Plan, set targets, and align strategic initiatives
- Enhance strategic feedback and learning

When these benefits are seen along with the three main objectives of the SRP, there appears to be some matches. They do not align exactly, but the objectives of the SRP seem to be meet them quite well. The objectives the SRP is hoping to achieve are the following:

- Improved accountability in the ADF
- Improved ADF planning
- Enhanced productivity in ADF
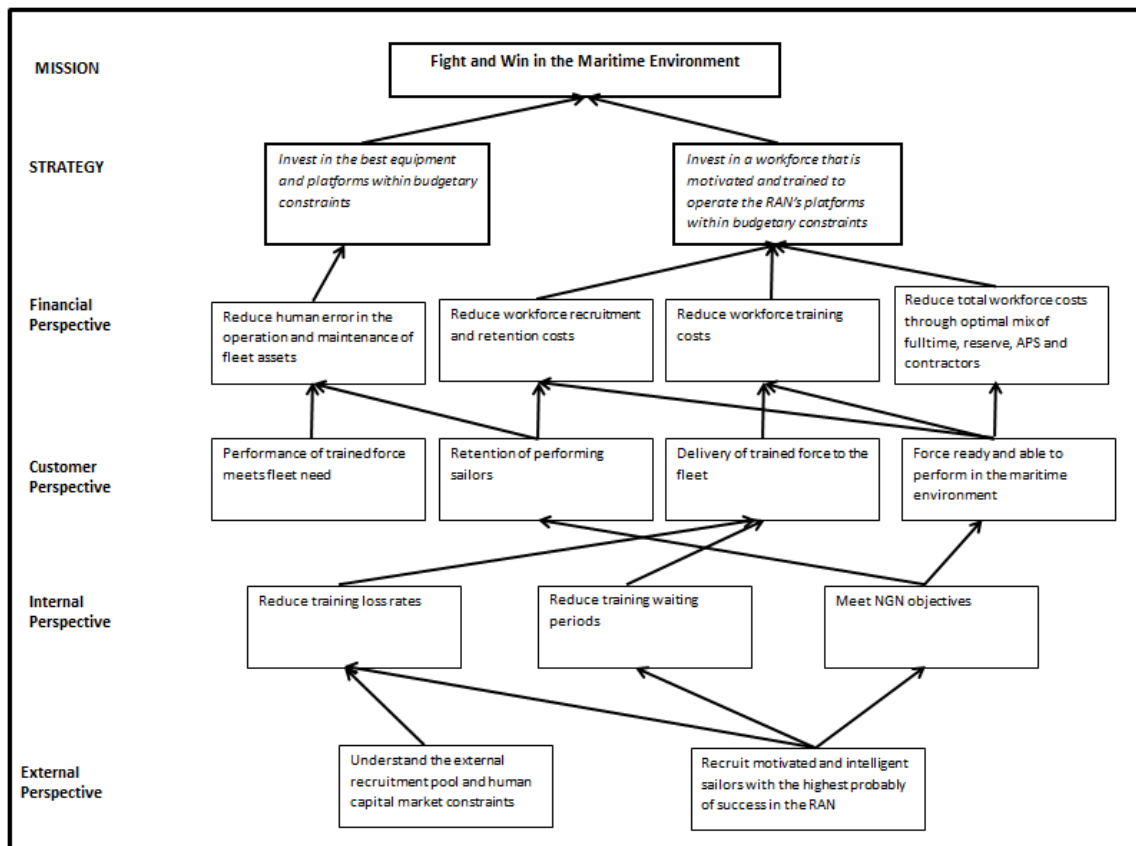
Figure 34.   RAN Human Capital Strategy Map

1.   External Perspective

As shown in Figure 34, the objectives suggested by this thesis for the RAN in consideration of the external perspective of human capital are listed below:

- Understand the external recruitment pool and human capital market constraints

- Recruit motivated and intelligent sailors with the highest probability of success in the RAN

The key focus of this perspective needs to be the RAN's understanding, monitoring, measuring and reporting of its ability to target and recruit to its target population. The RAN must focus on securing human capital at the start of the supply chain in order to grow. As well as recruitment, the organization must monitor the community health and overall production of its enlisted force.

2. Internal Perspective

As shown in Figure 34, the objectives suggested by this thesis for the RAN in consideration of the internal perspective of human capital are listed below:

- Reduce training loss rates
- Reduce training waiting periods
- Meeting the NGN objectives

All of these objectives flow on from the external perspective of human capital. The objectives of the internal perspectives are increasing the efficiency and effectiveness of the human capital supply chain. Through NGN, the RAN is seeking to create a culture that begins as soon as recruits enter the pipeline, and with the SRP, becoming more efficient at producing end products at the lowest possible costs. The use of Six Sigma will be most connected with these objectives and metrics, in the same way the USN uses PLM's. The source of these metrics will need to come from tracking sailors through the supply chain the same way the USN does with the WIP inventory tracker.

3. Customer Perspective

As shown in Figure 34, the objectives suggested by this thesis for the RAN in consideration of the customer perspective of human capital are listed below:

- Performance of trained force meets fleet need
- Retention of performing sailors
- Delivery of trained force to the fleet
- Force ready and able to perform in the maritime environment

The customer perspective is all related to getting the sailors to the fleet. The fleet is the customer of the RAN's human capital supply chain and all metrics should lead to whether or not the need of the fleet can be and is being met. This perspective is where the RAN must measure and monitor a metric unrelated to human capital or human capital supply directly. The end result is delivery of the sailors to the fleet, their retention, and their performance. Therefore, the RAN needs to have a metric related to sailor performance. If sailor performance is not satisfactory, all other factors about the quick delivery of getting the sailors to the fleet are inconsequential. This is based on Fitz-enz (1995) approach that the value added work is where the strategic objectives should be focused.

4.   Financial perspective

As shown in Figure 34, the objectives suggested by this thesis for the RAN in consideration of the financial perspective of human capital are listed below:

- Reduce human error in the operation and maintenance of fleet assets
- Reduce workforce recruitment and retention costs
- Reduce workforce training costs
- Reduce total workforce costs through optimal mix of fulltime, reserve, APS and contractors

The two key mission critical issues currently for the RAN are resource constraints and fleet sustainability. The RAN is extremely committed to NGN building a culture that can create leadership and gain the enlisted forces support to deliver the required objectives of the White Paper, SRP and Rizzo Review. Based on these three documents, the primary focus for the RAN is achieving the mission while reducing cost. Therefore, the metrics critical to human capital should focus on the cost of its workforce and maintaining fleet sustainability. These are the highest level human capital objectives and the executive should be demanding and receiving metrics that tell the RAN how they are performing in these objectives. The metrics should give the RAN an understanding of the costs drivers in its human capital system, as per the SRP's intent. The plan is to see the financial indicators improve, understand why they improve do or not improve, and then improve the system further.

C. SELECT METRICS TO MEASURE PERFORMANCE AND BUILD A DASHBOARD

Through the use of a Strategy Map the human capital objectives of the RAN have been established. A summary of the objectives is presented at Figure 35. Moving forward, the metrics that best measures the performance of these objectives needs to be established. Once established the metrics can be calculated, trended, benchmarked and presented.
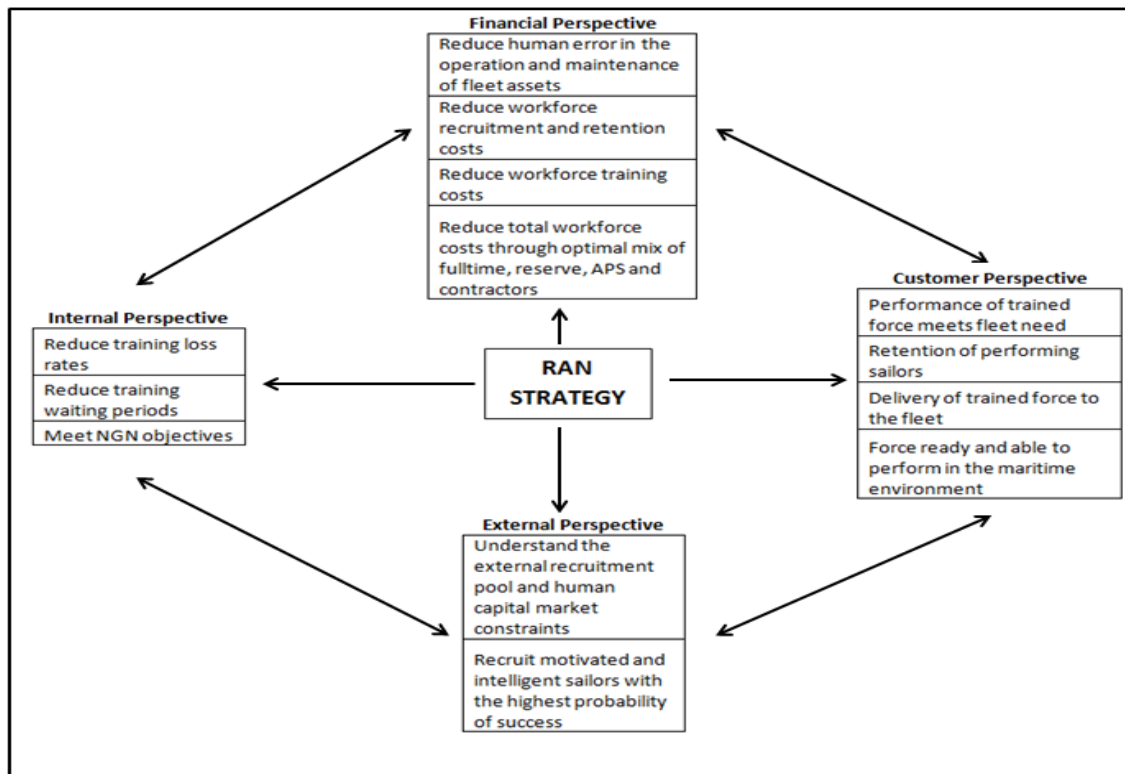
Figure 35.   RAN Linked Human Capital Objectives

The reason the Balanced Scorecard is so valuable is that once it is completed and agreed upon, there should not be much debate about the metrics an organization should be measuring and distributing. Using the template from Figure 13, this research has completed the objectives, metrics and initiatives in each of the four perspectives. Each metric is presented individually and then grouped into the four perspectives. Once the

dashboards are established, it is important to keep these tables and the Strategy Map because they remind stakeholders why the metrics they are reviewing are important.

The metrics presented in this section are based on the principle of the metric and not as a developed equation. The development of the equations to calculate the metrics is something that needs to be carried out if the RAN is going to develop a formal human capital measurement system. As stated by Niven (2008), it is extremely important to develop a data dictionary for all metrics calculated and used by the organization. The data dictionary will need to include the metric equation, where the source data is collected, how often it is collected, how often the metric is calculated, where the metric is reported and how often it is reported. The details of the data dictionary are key to the long-term accuracy and consistency of metric reporting.

The financial metrics should show the resource value added through the efficient and effective management of the internal supply chain. Because the RAN does not deal in revenue, cost savings and performance indicators are the way of seeing value added (Becker et al., 2001). Understanding what is causing the changes in the metrics begins with measuring, monitoring and analyzing the financial indicators. Therefore, although financial metrics are of significant interest, all perspectives must be monitored because the first question should be "why is this occurring?" The metrics from other perspectives should be able to provide an answer to this question.

No return on investment (ROI) measure has been used. ROI measures are extremely difficult to develop for human capital. It may be possible to use proxies such as rank, years of service, honors and awards, to form a ROI score, but this may not give valuable information about meeting organization objectives, even if it could be done. The RAN should monitor advances in the private sector regarding human capital ROI developments because it may be a valuable metric to track in the future.

1.   Metrics

The metrics this research has developed for the RAN are shown in figures 36–39. There is a table for each of the four perspectives and each table shows the metrics and matching human capital objective it is measuring When examining the external

environment, the metrics and graphs must not be viewed in isolation. The external metrics must be analyzed with cause and effect relations in mind. When a metric is highlighted as being significant, the cause of that metric being singled out must be found immediately. For instance, if recruiting is down, the external environment metrics, unemployment rate, and mining sector jobs should be reviewed. Finding the reasons or causes for changes in metrics is more important than addressing the changes themselves.

2. External Perspective Metrics

External Perspective

Objective	Metric	Target	Initiative
Understand the external recruitment pool and human capital market constraints	Number of Australians in the recruiting population		White Paper
	Unemployment rate		SRP
	Jobs created in all industries		
	Jobs created in the mining industry		
Recruit motivated and intelligent sailors with the highest probability of success	Recruitment success ratio		White Paper
	Recruit quality		SRP
	Recruit on time delivery rate		NGN

Figure 36.   RAN External Perspective Objectives and Metrics

a.   *Number of Australians in the Recruiting Population*

This metric is a simple aggregate of the target population for RAN recruiting. It is important to understand the recruiting pool in relation to the target recruiting goals, especially when reviewed along with the Army and Air Force recruiting goals.

b.   *Unemployment Rate*

The seasonally adjusted unemployment rate is a trend benchmark to understand the overall employment market. It is a leading metric when evaluating the likely difficulty in recruiting but possibly more importantly for understanding retention, turnover, and attrition effects.

c.   *Jobs Created in all Industries and the Mining Industry*

These metrics are aggregate numbers in order to benchmark the external environment and its effect on recruiting. It is important to understand job creation, unemployment rates and recruiting goals.

d.   *Recruitment Number/Recruitment Target Ratio*

This metric is a basic ratio measuring recruitment success. Is the RAN meeting its recruiting target? It is very important to review this metric in relation to metrics in the internal perspective because most likely any failure to meet recruitment targets is going to flow through to cause problems at each stage in the "Street to Fleet" pipeline. The effectiveness of the "Street to Fleet" pipeline starts with this metric, because the RAN needs to get recruits in the front end to give them any chance of producing sailors for the fleet.

e.   *Recruit on Time Delivery Rate*

Although the recruiting success rate may be at 100%, personnel may not be delivered to recruit training on time. The reason this is a problem is because the planned recruit delivery has flow on effects to the next stages of the training pipeline. Specifically, if a recruit is delivered one week late it means they will likely miss the follow-on category training course. The efficiency of the "Street to Fleet" pipeline starts with this metric. Further internal metrics that involve waiting time and efficiency time will all be impacted by the ability to get recruits into the system when planned.

f.   *Ratio of Recruits Ranked by Testing Band*

The RAN may be able to recruit an acceptable number of sailors to meet targets. However, the quality of those candidates is not measured in the recruit target metric. As well as getting recruits into the pipeline the RAN is interested in those who will be successful and perform as expected in the fleet. A leading metric, such as recruit quality, should be used to review the likely value added of recruits brought into the pipeline. The goal is to have high quality recruits who perform, do not fall to attrition, and are retained after their initial period of service. When reviewing the other recruiting

metrics, it will be important to review the percentage of A-band recruits. For instance, the recruiting target rate may only be 80% but they are all A-band recruits who have only a 3% attrition rate. This scenario will be better than having a 100% recruitment rate of all C-Band recruits who suffer attrition at a rate of 18%.

3. Internal Perspective Metrics

Internal Perspective

Objective	Metric	Target	Initiative
	Training loss rate		SRP
Reduce training loss rates	Reclassification rate		
	Training utilization		SRP
	Training attrition		NGN
Reduce training waiting periods	First term attrition and retention		
	Project Laser leadership rating		NGN
Meet NGN objectives	Project laser career satisfaction rating		Project Laser

Figure 37.   RAN Internal Perspective Objectives and Metrics

a.   *Training Loss Rate*

The training loss metric takes into account attrition, course failings, and administrative removal. Anytime a recruit does not move through the system as part of the planned pipeline, it is considered a loss. The reason this is important is because training losses will impact the timely delivery of the sailors to the fleet. It is a leading indicator of future delivery to the fleet in the medium term, and of the health of the fit and fill rates of the fleet in the longer term. Reducing loss rates allows for less loss to be built into the planning of the pipeline and allows the system to become more predictable.

b.   *Reclassification Rate*

The reclassification rate measures the number of recruits brought into the pipeline to be developed as a certain rating but who reclassify their rating before reaching the fleet. This metric is difficult to interpret because it is possible to be good or bad for the RAN. It could be bad because reclassification creates inefficiency in the system. However, it could be good because it is likely to improve retention since reclassification

is a way of correcting mismatches between sailors and the rating they were initially recruited into.

c.   Training Utilization Rate

The training utilization ratio is similar to "Street to Fleet" time, but does not include the time in a billet waiting to go to sea. This ratio includes the number of days a recruit is under training against the number of days from being delivered to recruit training to finishing category training. The equation will have to consider the effect of failing or reclassifying as these will skew the results.

d.   Training Attrition

The training attrition metric looks only at the number of recruits who attrite from the system during the "Street to Fleet" phases. It will measure the attrition as a ratio of all those who have started in the system.

e.   First Term Attrition and Retention

The first term attrition and retention metrics reviews which one of three groups each recruit is classified as by the end of their initial period of service or if they exit prior to this. Recruits either attrite, leave after the initial period of service, or are retained. Ideally the RAN would want most of its workforce to successfully navigate the training pipeline, qualify in their rating and then continue with their career in the RAN after their initial period of service. The next best alternative be may attrition. The real value the RAN gains from its enlisted force is when they are qualified and serve in the fleet after their initial sea service. If the sailor does not attrite but is not retained, the RAN will have invested the maximum in the sailor without return. If the sailor decides to attrite the RAN may have only invested a fraction of the maximum, despite the attrition creating inefficiency.

f.   Project Lazer Satisfaction with Leadership and Satisfaction with Career

Project Lazer is collecting very valuable leading metrics that can help forecast human behavior decisions such as attrition, retention and performance. As NGN

continues to develop the culture of the RAN, the benefits are planned to flow through all aspects of the RAN's human behavior and leadership. By using the satisfaction ratings, the RAN will be able to track the trends in two areas. Firstly, they will see the actual effect NGN is having on improving the perceived culture and working environment of the RAN. Secondly, Project Lazer will serve as a lead indicator of future retention and turnover of personnel. As per Figure 6, investment in human capital is not just about training, but also about the motivation aspects of a career. This is identified through NGN and measured by Project Lazer.

4. Customer Perspective Metrics

Customer Perspective

Objective	Metric	Target	Initiative
Performance of trained force meets fleet need	Task book competition time		Rizzo Review
	Technical sailor performance ratings		
Retention of performing sailors	High performance retention by rank		Rizzo Review
	Low performance retention by rank		SRP
Delivery of trained force to the fleet	Street to Fleet Time		SRP
	Total delivery to fleet/fleet need ratio		
	Fill rate		
	Fit rate		
Force ready and able to perform in the maritime environment	Total billets/sea billets		White Paper
	Individual readiness/total sea billets		SRP

Figure 38.   RAN Customer Perspective Objectives and Metrics

a. Task Book Completion Time

The "Street to Fleet" time and delivery rate is the delivery of the sailor to the fleet. However, the judgement of a qaulified and skilled sailor in the RAN is most commonly judged by the completion of their initial posting to the fleet. For majority of ratings the sailor will have a task book of competencies to achieve during this initial sea service. Achieving this milestone is possibly the best point at which to define that, for the rest of their time in the RAN, sailors are adding value through their work. Therefore, the time it takes for the enlisted force to complete their task book is just adding days onto the training pipeline towards the point where sailors are adding value. Emphasis should then

be placed on improving the taskbook completion time; in addition to the "Street to Fleet" time.

b.   Technical Sailor Performance Ratings

The specific variable inputs for this metric would most likely be sailor performance report scores. However, regardless of the specifics, a performance rating metrics is required. The main reason it is required is to review other metrics in relation to their effects on performance.

c.   High Performance Retention by Rank

The high performers turnover isolates a specific percentage of sailors in the top performance rating and reviews high performer leavers against total high performers. The priority for the RAN would be to try and retain those sailors in the high performer rating.

d.   Low Performance Retention by Rank

The low performers turnover isolates a specific percentage of sailors in the lowest performance rating and reviews low performer leavers against total low performers. The priority for the RAN would be to try and create turnover at the low performer level. This would only be possible if the health of each rating were to the point where the low performers could not be retained and the rating would still be at full health. This requires the pipline to be highly effective at delivering recruits through the supply chain.

e.   Street to Fleet Time

The "Street to Fleet" time is the most important efficiency metric that the RAN should be tracking. This metric measures the time that it takes the recruit to move through the training pipeline. This time is measured from when a sailor reaches initial recruit training through to when they reach the fleet. The aim would be to minimize the "Street to Fleet" time in order to reduce the cost of the training pipeline. Therefore, as the

"Strret to Fleet" time fluctuates, the total intitial training cost would be expected to fluctuate.

f. Fill Rate

The fill metric is based on the USN version of the metric. The metric is a ratio of the number of sailors posted to sea plaforms against the number of sea billets. It does not take into account skill matching between the sailor and the billet they occupy.

g. Fit Rate

The fit metric is extremly important and the key effectiveness metric of the human capital supply chain. This metric is based on the USN version and is the ratio of sailors who match the rank, rating and qaulification of the billet they occupy in the fleet against the total number of fleet positions. The metric is the effective cumulation of the whole human capital system and helps put a number to understanding if the sailors are in the right job, at the right place, at the right time. The difference between fill and fit is a metric in its own right because it shows the degree to which positions are being filled with unqualifed and/or mismatched sailors.

h. Total Billets/Fleet Billets

The total billets/fleet billets metric reviews the balance of sea and shore billets. This ratio puts into context the total number of personnel who are required to sustain the high tempo work environment in the fleet. This metric is best viewed when broken down by rank. It is also valuable when considered against the number of sailors in each rating who are unable and/or unwilling to return to sea. This metric, when reviewed against this information, becomes a leading metric for retention because of burnout due to only a small percentage of a rating doing all the sea duty.

i. Individual Readiness/Total Force Ratio

The individual readiness force ratio reviews the effectiveness of the enlisted force. It measures the total number of indivdual ready sailors against the total number of enlisted fleet billets. Therefore, by substracting 100 from the metric, the RAN

is able to establish fleet bench strength. This metric is a strong indicator for fleet morale and a possible leading metric for retention and turnover. The reason for this is that it captures over use of sailors and, therefore, those who are more likely to leave the workforce much earlier due to their over exposure to the hardships of continually serving in the fleet.

5.   Financial Prespective Metrics

Financial Perspective

Objective	Metric	Target	Initiative
Reduce human error in the operation and maintenance of fleet assets	Unplanned delays due to fleet maintenance (in days)		Rizzo Review
	Injuries in fleet		SRP
Reduce workforce recruitment and retention costs	Retention bonuses planned, allocated and issued		NGN
	Total recruitment costs		SRP
Reduce workforce training costs	Cost of the recruit and initial training system		SRP
	Total cost of the training system		
Reduce total workforce costs through optimal mix of fulltime, reserve, APS and contractors	Total workforce pay and benefit costs		White Paper
	Numbers of fulltime, reserve, APS and Contractors		SRP

Figure 39.   RAN Financial Perspective Objectives and Metrics

a.   *Unplanned Delays Due to Fleet Maintenance (in days)*

Based on the priorities of the Rizzo Review, the ability for the fleet to sail as planned is a priority for the RAN. Findings from the review believed human errors contributed to maintenance issues; therefore, a form of performance metric should monitor this issue. This metric should be tracked in partnership with the RAN's Fleet Command and Defence Material Organisation (DMO). It is also possible to attribute costs to maintenance issues and report these on the dashboard as well.

b.   *Retention Bonuses Planned, Allocated and Issued*

The use of resources to retain personnel needs to be monitored critically because the loss of trained personnel is extremely costly for the RAN. Tracking the retention bonuses issued and the take up should be of high importance. This information

should then be reviewed along with retention and turnover. The decision to issue retention bonuses will greatly be enhanced with this information as well as information relating to replacement lead time and training cost. This information can be gained from a pipeline tracking system.

c.   Total Recruitment Costs

The total recruiting cost for the RAN is a large resource that should be monitored. One difficulty of this metric is that the majority of recruitment costs are shared with the Army and Air Force. The more effective the RAN becomes in its management of the human capital supply chain the less reliant it will need to be on recruiting, and costs should be saved.

d.   Cost of the Recruit and Initial Training System

Based on improvements made in the "Street to Fleet" management and tracking metrics, improvements in the effeciency of the training system should be evident. The objective of efficiency improvement is to reduce the total training cost for the RAN, including trainee salaries and benefits. Using the raw aggregate number of the total cost from "Street to Fleet" is a key metric to show that the system is improving and resources are being saved. It is also possible to measure this cost using total cost against the number of recruits through the pipeline. However, the high cost of fixed infrastrucutre will take away from the value of the metric. If the system does become more efficient, it is possible that fixed infrastructure and other fixed overheads could be removed because the same capacity will not be required.

e.   Total Cost of the Total Skill and Leadership Ttraining System

This metric aggregates the total cost of all initial, category, skill and leadership training in the RAN. The metric is best viewed as a trend and has most value when compared with performance and retention metrics. The hypothesis is that the more training, the better the performance. Also, another hypothesis would be that the better a sailor and their peers are trained, the better motivated they all are and subsequently there will be higher retention rates.

f.   Numbers of Fulltime, Reserve, APS and Contractors and Total Workforce Costs

By aggregating the total workforce numbers, the RAN can understand its force composition. A key objective of the White Paper is to manage this mix. These metrics are most relevant when trended and understood in relation to the total workforce cost. The aim for the RAN should be to reduce the total workforce costs while maintaining or increasing the level of its perfromance metrics. This further emphasizes why, even when measuring human capital supply chains, performance metrics are so important.

6.   Dashboards

The use of dashboards allows for the consistent presentation of the metrics in a simple form that has a lot of information in a small space. Dashboard metrics should be assembled based on the audience: therefore, this research suggests the RAN uses two different dashboards: an executive dashboard and stakeholder dashboard.

The executive dashboard is based on the financial perspectives metrics, shown in Figure 40. It is designed to report to the senior levels of the RAN, ADF and, if required, the Australian Government. Through the metrics on this dashboard the RAN can demonstrate how it is meeting its human capital objectives and how it is performing in human capital management. These dashboards should be clear, concise, and brief to provide a quick snapshot.

The stakeholder dashboards present all the human capital metrics in each of the four Balanced Scorecard perspectives. The initial dashboards developed by the RAN should be based on all sailor ratings, but as the IT support is introduced, the dashboards should be able to be presented for each rating. These dashboards should be presented to the stakeholders to highlight the success of meeting all human capital objectives. The key stakeholders in the RAN's human capital management who should be presented the dashboards are the units responsible for recruiting, initial training, category training and career management; as well as the Fleet Commander, who is the end customer in the

Street to Fleet model. These dashboards should be the primary agenda item for combined stakeholder meetings, in order to find improvements across the whole system.

The purpose of presenting all the dashboards to stakeholders and having so much information is to present stories and relationships rather than only data or isolated metrics. Having a story to tell within a dashboard avoids myopic sub-optimization where an organization becomes over reactionary to changes in only a single metric (Vailliancourt, 2007). Benchmarking is also very valuable in continuing to tell the story of what is actually occurring with all the metrics rather than fixating on a particular metric.

Metrics will be most valuable when trended because the improvement or regression overtime can be seen. This internal benchmark is critical to understanding whether improvement is occurring. Internal benchmarking through trending helps put metrics into context. Trending can illustrate the point at which a human capital policy took place and the effect of that policy change moving forward. Once the measurement system moves into maturity, internal benchmarking through trending can be replaced with targets. Targets remove the clutter from the dashboards and also allow for a traffic light system to be introduced. Traffic lights, green, yellow and red markings, will provide more efficiency in the metric review process because the stakeholders can immediately begin reviewing areas of their concern.

External benchmarking is key to improvement and will not become internally restricted. It is recommended that the RAN form a relationship with the USN to benchmark human capital metrics. As well, the RAA and RAAF, should help develop the metrics project as a joint venture. The relationship gained through benchmarking can further lead to cross-organizational Six Sigma improvement and learning.

Based on the metrics developed in this research, four sample dashboards have been developed based on each of the four perspectives from the Strategy Map in Figure 34. The four dashboards are shown in figures 40–43. A key feature of each dashboard is the traffic light summary of the perspectives metrics in the middle of each dashboard.

The summary table gives stakeholders a quick reference guide to understanding if the metrics are meeting the targets they set for each metric.

RECRUITING COSTS

	2008	2009	2010	2011	2012
RAN	$ 35,000,000	$ 37,500,000	$ 37,500,000	$ 38,000,000	$ 35,000,000
RAA	$ 80,000,000	$ 82,500,000	$ 82,500,000	$ 83,000,000	$ 80,000,000
RAAF	$ 23,000,000	$ 25,500,000	$ 25,500,000	$ 26,000,000	$ 23,000,000
USN	$ 200,000,000	$ 200,000,000	$ 200,000,000	$ 200,000,000	$ 200,000,000

RENTENTION BONUSES 2012

	Planned	Allocated	Issued	Up take
RAN	$ 1,250,000	$ 1,250,000	$ 1,127,000	89%
RAA	$ 1,100,000	$ 1,100,000	$ 1,200,000	76%
RAAF	$ 800,000	$ 900,000	$ 755,000	88%
USN	$ 10,000,000	$ 10,000,000	$ 7,700,000	75%

Sailing Success (chart, 2008–2012)

FINANCIAL PERSPECTIVE

	Current Performance	Target	
Sailing Success	95%	98%	
Retention Bonuses	$1,127,000	$1,250,000	
Recruiting Cost	$35,000,000	$45,000,000	
Total Street to Fleet Costs	$395,307,000	$350,000,000	
Total Workforce Cost	$1,053,450,000	$1,000,000,000	

RAN Workforce Demographics 2012

	Headcount	Total Cost
FTE	13300	$ 864,500,000
Reserves	2000	$ 30,000,000
APS	2330	$ 151,450,000
Contractors	265	$ 7,500,000
Total	17895	$ 1,053,450,000

Street to Fleet Cost Per Unit Delivered (chart)
— RAN STF by unit of delivery — USN STF by unit of delivery

RAN Retention Bonuses (chart, 2007–2012)

Total Human Capital Costs (chart)
— RAN — RAA — RAAF

RAN and USN Street to Fleet Costs

	2007 Cohort	2008 Cohort	2009 cohort	2010 cohort	2011 cohort
Total Training Costs	$ 432,000,000	$ 475,200,000	$ 522,720,000	$ 574,992,000	$ 632,491,200
RAN Street to Fleet Cost	$ 270,000,000	$ 297,000,000	$ 326,700,000	$ 359,370,000	$ 395,307,000
RAN STF by unit of delivery	$ 225,000	$ 247,500	$ 272,250	$ 299,475	$ 329,423
Total Training Costs	$ 5,250,000,000	$ 5,407,500,000	$ 5,569,725,000	$ 5,736,816,750	$ 5,908,921,253
USN Street to Fleet Cost	$ 3,000,000,000	$ 3,090,000,000	$ 3,182,700,000	$ 3,278,181,000	$ 3,376,526,430
USN STF by unit of delivery	$ 90,909	$ 93,636	$ 96,445	$ 99,339	$ 102,319

Figure 40.   RAN Financial Human Capital Metrics Dashboard
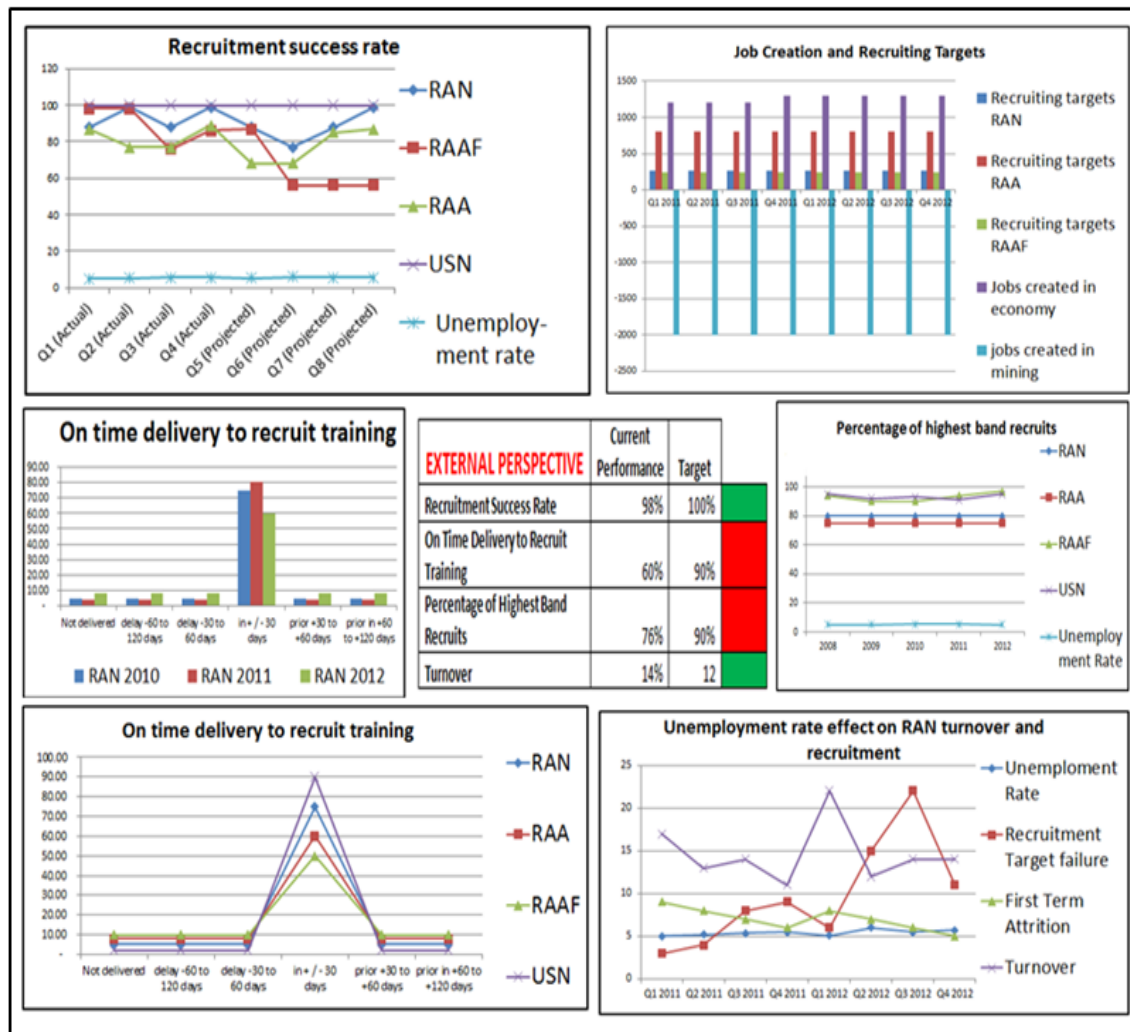
Figure 41.   RAN External Human Capital Metric Dashboard
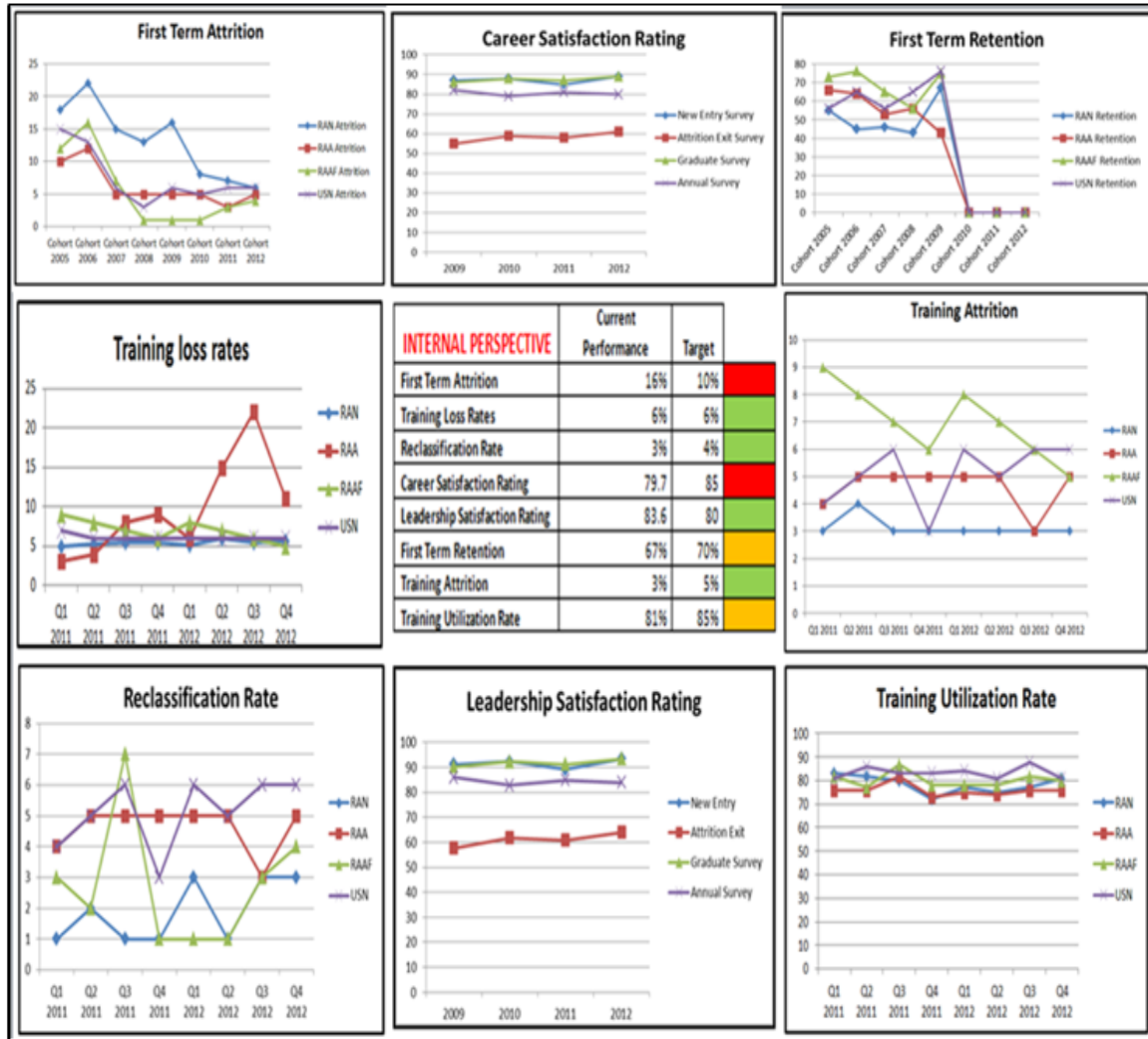
Figure 42.   RAN Internal Human Capital Metrics Dashboard

Ready for Promotion

Legend: MT, ET, BM, CSO, CIS, SU

(Chart: y-axis 0%–350%, x-axis categories AB, LS, PO, CPO)

TASK BOOK COMPLETION RATES

		2007 cohort	2008 cohort	2009 cohort	2010 cohort	2011 cohort
ALL	On time completion	67%	77%	59%	81%	79%
	Completion after due date	41%	33%	49%	31%	27%
	Attrite	13%	12%	15%	11%	16%
MT	On time completion	55%	63%	48%	66%	65%
	Completion after due date	34%	27%	40%	25%	22%
	Attrite	11%	10%	12%	9%	13%
ET	On time completion	60%	62%	57%	48%	60%
	Completion after due date	32%	31%	34%	55%	32%
	Attrite	8%	7%	9%	7%	8%

Turnover by Performance Rating

(Chart: y-axis 0–18, x-axis categories SMN, AB, LS, PO, CPO; High Performers, Low Performers)

CUSTOMER PERSPECTIVE	Current Performance	Target
Fit Rate	86%	97%
Fill Rate	94%	100%
Individual Readiness	90%	96%
Street to Fleet Time	136%	130%
Task Book Completion rate	79%	93%
Sailor performance	83	90
Promotion Readiness	225%	250
High Performer Turnover	8	5
Low Performer Turnover	6	15

Force Individual Readiness

(Chart: y-axis 0%–100%, x-axis Q1 2011 – Q4 2012; Individual Readiness, Sea/Shore Billet Ratio)

	FIT			FILL		
	2010	2011	2012	2010	2011	2012
RAN	0.82	0.84	0.86	0.94	0.94	0.94
USN	0.85	0.86	0.87	0.93	0.95	0.97

	RAN	RAA	RAAF	USN
YTD Street to Fleet ratio	136%	132%	140%	137%

	RAN 2010	RAN 2011	RAN 2012
Total	144%	139%	136%
MT	155%	153%	145%
ET	148%	144%	135%

Sailor Performance Ratings

(Chart: y-axis 0.7–0.95, x-axis 2008–2012; MT, ET, BM, CSO, CIS, SU)

Figure 43.   RAN Customer Human Capital Metrics Dashboard

D.   USE A SUPPLY CHAIN APPROACH TO MEASURE HUMAN CAPITAL FLOW

Primarily the Strategy Map and the dashboard metrics review how the RAN is reaching its objectives to achieve the mission it is directed by the Australian Government to achieve. However, the RAN is required to achieve these objectives within a resource-constrained setting, requiring trade-offs in allocating resources. Human capital and physical capital are the largest expenditures for the RAN and part of human capital management is ensuring the resources allocated to the workforce are used efficiently and effectively.

The metrics on the dashboards give the RAN stakeholders an overview of whether its human capital is managed efficiently, but it lacks depth. The RAN needs to implement a system similar to that of the USN Work in Process (WIP) inventory tracker to manage its pipeline more systematically and have the data to identify and fix areas needed for improvement. Also some of the metrics on the dashboards require the information from human capital supply chain measurement to calculate or supply the metrics to the dashboard.

Measurement is the key to quality management decisions (Harrington, 1991). For organizations with internal human capital supply chains, it is critical to understand what is occurring in the system (Lepak & Snell, 1999). The use of a "Street to Fleet" model will give the RAN the ability to analyze trends and make subsequent improvements as necessary. It will also allow the close monitoring of critical training pipelines (HR Focus, 2005). Knowledge of the lead times, production capacity, and bottlenecks, will lead to efficient use of resources and better management decisions. Military structures are perfect to measure career progression and human capital supply because of the rigidity of movement through the system and the defined organizational structure. Figure 44 is the model this research has developed based on the USN Street to Fleet supply chain model. The information is most valuable when filtered by rating rather than grouping in all ratings.

	Wait	Recruit School	Wait	Category Training	Wait	Shore billet	Delivered to Fleet	Qualified in Fleet
Entitlement	0	66	14	175	12	220	\	180
Mean	65	72	20	195	12	125	\	221
Mode	28	66	14	180	12	127	\	195
Std Dev	20	5	6	24	1	32	\	43
Min	1	66	1	175	1	12	\	165
Max	298	132	112	265	33	435	\	999
Population	855	855	855	855	855	855	\	855
Lead Days Entitlement	487	487	421	407	232	220	\	180
Lead Days Actual	489	424	352	332	137	125	\	221

Figure 44.   RAN Street to Fleet Supply Chain Metrics

In order to develop the inventory tracker, the RAN will need to have the following data:

- Training capacities

- Cycle costing

- Supply chain phasing costs

- Recruiting targets

- Fleet needs

- Career manager needs

The hardest of these data sources to collect is the costs allocated to each element of the training pipeline and total cycle costing. However, arguably this information is the most important and is absolutely critical. Without this information, cost tradeoffs cannot occur. Also, in the future when perceived efficiency gains are being made, the use of these costs needs to be calculated to prove that costs are actually being reduced. In the end, this process is about cost savings. Therefore, the system must be able to track and report the cost savings it has affected.

The primary objective of the RAN should be to get a system similar to the USN's WIP inventory tracker. The implementation of the system will require custom software that will need to be developed to pool the data and present the metrics in functional reports. Also, there is a need to develop a data/metric hierarchy similar to the USN's in Figure 21. Once the tool is in place and a dashboard platform is developed, the RAN can have a functioning system with a medium to low level of manual entry and manipulation. This will then allow resources to be allocated to the analysis and improvement of the human capital supply chain.

E.   USE SIX SIGMA TO ACHIEVE BETTER RESULTS IN HUMAN CAPITAL FLOW

If implemented by the RAN the true value of a human capital supply chain measurement system will not be in the metrics but what the RAN would do with them. To get value, and/or resource savings, the RAN must use the metrics to achieve efficiency and effectiveness improvements. Through the use of Six Sigma, or similar philosophy, the RAN can make significant efficiency improvements. The value of this

function will be seen when improvement in the internal and customer metrics translate into improvement in the financial metrics.

Developing a Six Sigma approach will require the analyzing and drilling down to find problem areas through the use of an independent stakeholder similar to the USN's PLM's. The RAN should implement a similar system to monitor and oversee supply chain improvements. The need to have an independent authority outside of the supply chain stakeholders perform this function is fundamentally important. The lack of a vested interest will allow this function to provide independent and unbiased advice to the stakeholders.

The RAN will most likely require the need to hire or build up a knowledge base in efficiency improvement. A good candidate would be to use technical enlisted sailors and officers to undertake training in Six Sigma and then staff a PLM equivalent function. The use of technical personnel has two possible benefits. Firstly, technical ratings are an area of the highest concern in the workforce management at the moment. Secondly, the knowledge base gained from Six Sigma or an equivalent skill set will be highly valuable for technical personnel when they transition to other positions throughout their career in the RAN.

Based on the benefits suggested by Albeanu and Hunter (2009), the RAN can expect to receive the following benefits from using the metrics gained from the supply chain inventory tracker:

- Eliminating inefficient, non-value added steps in a process – opportunities for defects are directly proportional to the number of steps in the process
- Eliminating bottlenecks within the process
- Using well-defined procedures and processes and training the staff who perform these activities to a very competent level
- Facilitating a good flow of information between all parties involved in the process
- Standardizing the process so that the same way of delivering service is achieved across all iterations

F.   DEVELOP POLICY RELATED CAUSE AND EFFECT RELATIONSHIPS

Changes in metrics occur for a reason, and the best way to understand why they occurred should be by reviewing the same dashboard. The real value of the Balanced Scorecard approach is the understanding of cause and effect relationships (Le Blanc et al., 2000). By using econometric tools, the data will be able to ascertain the likely causes for changes in key metrics such as recruitment, retention, and performance. As identified by the USN, when human behavior is involved there is no perfect system and no optimal solution. However, to ignore management of the system means considerable that resources will be wasted through inefficiency

A possible addition to help use the information gained from metrics is to use a optimization tool to help with decisions. Simulation could be used to achieve the most efficient or effective result given likely inputs, based on knowledge about cause and effect relationships. For example, is it better to increase recruiting advertising by ten million dollars, or give the money to the current force through retention bonuses? Or, instead of giving retention bonuses, or would it be better give signing or milestones bonuses? This research is not suggesting that the RAN will make flawless decisions when armed with metrics. However, it will be in a much better position to do so. What should be expected is the use of metrics leading to better educated decisions.

G.   CHAPTER SUMMARY

Chapter II sets a framework for any organization seeking to develop a human capital measurement system. Chapter III shows that the RAN is able to use best practice in the private sector and the example of the USN PMO to build a human capital measurement system. The RAN wanted to understand if they are able to measure if they are investing in their human capital efficiently. The key to understanding the correct metrics to select is using a Strategy Map to understand the organization's objectives. Once the objectives are set it is relatively straight forward to determine the metrics that will best measure whether the RAN is achieving the objective.

What the RAN must understand is that measuring and reporting the metrics are just the first half of the steps of adding value through metrics. The real value is gained

from using Six Sigma, optimization, and simulations. These three tools help the organization identify areas for improvement and then to make better decisions moving forward. The primary motivation to implement a human capital measurement system is to save costs. These tools will put the RAN in a position to do this, however they must also be able to quantify accurate cost savings. Cost accounting should be used to develop benchmark variables and fixed costs of the RAN's human capital investment, development, and training.

IV. SUMMARY, CONCLUSIONS & RECOMMENDATIONS

A. SUMMARY OF FUNDAMENTAL APPROACH TO HUMAN CAPITAL METRICS

In recent years economic conditions have put most private and public sector organizations under significant pressure to cut costs and find skilled technical workers at a time where there is a global shortage of such skills. The management of human capital is critical to achieving any organizations' mission. The first step in managing human capital is the understanding of the state of the human capital of any organization; this knowledge is gained through the selection, measurement and presentation of human capital metrics. Although strategic human capital measurement systems have been used by the private sector, examples of its use in the public sector are limited to the United States Navy (USN).

The in-depth review of human capital metrics presented in this research highlights some important take-away points. As Fitz-enz (1995) advocates, all human capital metrics should be focused on value added areas of the workforce and not just areas that are easy to measure. In addition, the Strategy Maps and the Balanced Scorecard were developed by Kaplan and Norton (1996a; 1996b) are effective tools to help focus organizations on these value adding functions and help the organizations develop metrics linked to their mission, strategy and objectives.

For organizations with primarily internal human capital sourcing, such as the RAN, as Giehll (2011) recommends, traditional supply chain management tracking and metrics can be used to monitor, measure, and improve the organizations management of human capital. In addition, Six Sigma is an effective tool for identifying and fixing problems in internal human capital supply chains. The most powerful approach an organization can take is to track and calculate accurate costs for each step in the human capital development process. This valuable process will provide organizations with the opportunity to make better human capital decisions in support of their mission. Optimization and simulation tools can use the metrics produced by an organization to

help automate decision alternatives, costs, benefits and expected outcomes from policy changes.

B.   CONCLUSIONS AND RECOMMENDATIONS

The key findings from this research were developed through an in-depth review of the USN's Enlisted Supply Chain model and research from the private sector. Through analyzing the current environment of the Royal Australian Navy (RAN) this thesis was able to show the main findings from the USN case study and the private sector experience can be adopted by public service organizations to more efficiently manage their human capital and make better personnel policy decisions. The RAN can use this research to implement the recommendations and receive the intended benefits. Moreover, other public organizations can also use the findings of this research to implement a human capital measurement approach in their own organizations.

The remainder of Chapter IV reviews the main findings from this research as they relate to the specific objectives set for this thesis, and formulates specific recommendations for the RAN.

1.   Formulate a general set of steps for implementing a human capital measurement system, accompanying metrics and an executive dashboard

a.   Conclusion

This research formulated the following six steps to link human capital metrics and the RAN's personnel mission:

- Link organizational strategy and human capital needs
- Create a Strategy Map and determine objectives
- Select metrics to measure performance and build a dashboard
- Use a supply chain approach to measure human capital flow
- Use Six Sigma to achieve better results in human capital flow
- Develop policy related cause and effect relationships

Using the Strategy Map and Balanced Scorecard tools are key to linking the steps together because the use of the tools sets the foundation that enables

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organizations to determine the best metrics they should be monitoring to indicate that they are achieving their objectives. Although these tools developed by Kaplan and Norton (1996a) are recommended, they do not have to be followed rigidly. Organizations are able to use the parts that are applicable and help drive the organization towards the best indicators that their objectives are being achieved. In order to receive the greatest benefit from human capital metrics, organizations need to ensure they follow through with the steps suggested above. The greatest benefit from tracking the metrics are not gained just from the measurement process, but the subsequent improvements made through having a greater understanding of what is occurring with the organization's human capital.

b. Recommendations

- The RAN should form a human capital working group consisting of the stakeholders in its human capital supply chain. The working group should review the findings of this research to alter and/or confirm current strategic implications affecting its workforce and the objectives they determine critical to achieving its strategy and therefore mission.

- The working group should implement the metrics outlined in Chapter III in support of establishing a human capital supply chain in the RAN.

2. Examine whether the USN supply chain management model is a valid construct for the RAN to use to manage its human capital

a. Conclusion

The systematic approach taken by the United States Navy's (USN) Production Management Office (PMO) to collect data and manage the delivery of sailors to the fleet is an innovative approach to human capital management. Despite vast differences in the force structure between the USN and RAN workforces, the PMO model is capable of serving as a model for the RAN. To ensure the RAN has the required skill sets to improve the efficiency of its "Street to Fleet" pipeline the RAN would be required to train a number of subject matter experts in supply chain improvement.

The key metrics used by the USN that are most relevant for the RAN are "Street to Fleet" time, on time delivery, fill rate and fit rate. The first two metrics are important metrics to measure efficiency of the human capital supply chain, while the fit and fill rates are important effectiveness metrics. By adding accurate costs to these metrics and others suggested in this research, the RAN can make the most cost efficient human capital investment decisions. To make these decisions, simulation tools can be used to automate the decision alternatives based on their associated costs and benefits. This is extremely valuable when analyzing possible human capital policy changes.

b.   Recommendations

- Implement a pipeline production tracking system similar to the USN's 'Work in Process' inventory tracking tool.
- Develop training to create subject matter experts in supply chain management improvement.
- Use cost accounting to assign costs to the "Street to Fleet" pipeline.

3.   Outline implementation considerations for a human capital measurement system for the RAN

a.   Conclusion

The USN had great difficulty when establishing the PMO because supporting data was spread across numerous knowledge management systems. The accuracy of data metrics is critical to supply chain management. A high priority should be to ensure all data can be sourced, and what IT support is required to do this task. Numerous companies specialize in the development of custom software that will bring together the systems and pull the required data. Once the data has been centralized the production and distribution of metrics becomes automated and much more efficient. To determine if the benefits received from automating the data sourcing and manipulation to generate human capital metrics is cost efficient a cost benefit analysis would need to be performed.

As part of the Strategic Reform Program (SRP), Navy, Army and Air Force are directed to work together to achieve economies of scale and minimize shared

services costs. Based on this directive, the three services would be meeting the objectives of the SRP by conducting a human capital metrics project together rather than separately. As well as sharing the costs, expertise from each service would be shared to benefit all three services. The three services would benefit from benchmarking human capital metrics among one another. The RAN would also benefit from forming a benchmarking partnership with the USN.

b. *Recommendations*

- Conduct a cost-benefit analysis to determine if they should procure custom software to automate data sourcing and manipulation.
- Work with the Army and the Air Force to develop a joint human capital and supply chain measurement system.
- To establish reliable external benchmarks, the RAN should engage with the USN's PMO to form a human capital benchmarking relationship.

C. FURTHER RESEARCH

- Examine the viability of the RAN purchasing an optimization tool to determine the optimal inputs, loss rates, attrition and retention for the RAN to achieve the best performance and cost trade-offs.
- Conduct an analysis to determine if the current expenditures the USN have invested in the PMO has resulted in equal or greater savings by improving the efficiency of the USN enlisted Street to Fleet efforts.
- Research return on investment metrics to be used for military manpower in order to determine optimal training investment.

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